The Oil and Gas Journal

PRODUCING REFINING ENGINEERING MARKETING

VOL. 27. NO. 27. TULSA, OKLAHOMA, NOVEMBER 22, 1928

Copyright, 1928, by The Petroleum Publishing Co

TABLE OF CONTENTS

SPECIAL ARTICLES

Crude Petroleum Outlook Is Brighter 35
By Andrew M. Rowley
Big demand for sweet oil the dominant factor in situation. California expected to handle own problem.

Big Drilling Campaign on at Mission 37
By J. L. Dwyer
Nearly $5,000,000 being spent for present operations.

Oil From Coal Processes Gain Ground 38
By Special Correspondent
Mr. Teagle tells bituminous coal conference industrialization cannot be overestimated.

Committee Will Study Crooked Holes 39
By Thomas F. Smiley
Mid-Continent district engineers decide on investigation.

Overproduction in Fuel Oil Area 40
By Ernest R. Lilley
Problems that beset industry from Spindletop to Cushing.

Oil Conservation Legislation With Committee 40

California Natural Gasoline Meeting 41
By L. P. Stockman
President Ratcliffe describes present conditions.

I.O.M.A. Market Congress 41
By J. B. Waldo

Rocky Mountain Engineering Practice 42
By Frank B. Taylor
Papers at meetings of Oil and Gas Association and engineers.

Jim Le Goullon Was Friend to Many 42
By Thomas F. Smiley

Facilities Available to Field Men (Editorial) 44

Well Back Pressure and Fluid Levels 50
By S. F. Shaw
Submergence and other factors in air and gas lift.

Causes and Effects of Crooked Holes 51
By E. J. McKee
Excessive weight considered primary reason in many cases.

Field Problems and Their Solution 77
Edited by Thomas F. Smiley

Important Factors in Pumping Wells 88-B
By Mid-Continent Committee on Production Practice, J. R. McWilliams, Chairman

Inspection and Care of Wire Ropes 88-D
By Glenver McConnell
Mid-Continent sub-committee makes exhaustive study.

Oklahoma Production, Third Quarter 101

Big Amalgamation in Oil Tool Industry 122

New Umpire in Hendricks Pool 143

FIELD OPERATIONS

West Texas 46-161
By James H. Dameron

Late Fields 47

North Texas and Panhandle 48-161
By James H. Dameron

Oklahoma 52
By J. L. Dwyer

Kansas 54
By J. L. Dwyer

North Louisiana-Arkansas 57
By D. H. Bancroft

Gulf Coast 59
By Neil Williams

Canada 59
By Victor Lauriston

Southwest Texas 60
By B. D. Stevenson

California 63
By L. P. Stockman

Eastern Fields 68
By D. S. Wakenight

Kentucky-Tennessee 68
By Whit

Central West 72
By Whit

Rocky Mountain Area 88-A
By Tolbert R. Ingram

Muskegon, Michigan 88-A

REFINING AND MARKETING

Wide Spread Exists in Gasoline Prices 36
By C. O. Willson
Difference of 1 cent a gallon in high and low of Oklahoma U. S. Motor grade. Bright stocks strong.

Properties Required in Motor Fuels 123
By Charles E. Kern
German scientists determine desirable characteristics.

Chicago Movement Mostly on Contracts 126
By J. B. Waldo
Gasoline prices above view of buyers. Distillate orders grow.

Softer Undertone to Gasoline in East 127
By Special Correspondent
Tank car market continues to hold at 11 cents.

Brief Items for Petroleum Refiners 130

Natural Gasoline Manufacture 131

Refinery and Crude Prices 132-133

Tank Wagon Quotations 134

Technical Questions Answered 138
By Dr. C. K. Francis

Of Interest to Sales Departments 146

Foreign Trend in New Motor Fuels 148
By John H. Nelson
Many experiments under way with liquid and gaseous products.

ARTICLES OF GENERAL INTEREST

The Advertisers' Index 33

Equipment and Supplies 74

Natural Gas Developments 80

Men Known in Oildom and Personals 98

Classified Want Advertisements 124-125

Oil Securities Advancing 136-137

Crude Petroleum Statistics 176

BE A REGULAR READER

The Oil and Gas Journal Tulsa, Okla.

You are hereby directed to mail The Oil and Gas Journal to me for.....year. Enclosed find remittance $.....

Classify my interests as checked by me.

.....Producing .....Refining

.....Equipment .....Marketing

Name.....

Address.....

City.....

$6 a Year

$3 6 Months

Refinery Section Starts on Page 123

The Oil and Gas Journal

PRODUCING REFINING ENGINEERING MARKETING

VOL. 27. NO. 27. TULSA, OKLAHOMA, NOVEMBER 22, 1928

Copyright, 1928, by The Petroleum Publishing Co

TABLE OF CONTENTS

SPECIAL ARTICLES

Crude Petroleum Outlook Is Brighter 35
By Andrew M. Rowley
Big demand for sweet oil the dominant factor in situation. California expected to handle own problem.

Big Drilling Campaign on at Mission 37
By J. L. Dwyer
Nearly $5,000,000 being spent for present operations.

Oil From Coal Processes Gain Ground 38
By Special Correspondent
Mr. Teagle tells bituminous coal conference industrialization cannot be overestimated.

Committee Will Study Crooked Holes 39
By Thomas F. Smiley
Mid-Continent district engineers decide on investigation.

Overproduction in Fuel Oil Area 40
By Ernest R. Lilley
Problems that beset industry from Spindletop to Cushing.

Oil Conservation Legislation With Committee 40

California Natural Gasoline Meeting 41
By L. P. Stockman
President Ratcliffe describes present conditions.

I.O.M.A. Market Congress 41
By J. B. Waldo

Rocky Mountain Engineering Practice 42
By Frank B. Taylor
Papers at meetings of Oil and Gas Association and engineers.

Jim Le Goullon Was Friend to Many 42
By Thomas F. Smiley

Facilities Available to Field Men (Editorial) 44

Well Back Pressure and Fluid Levels 50
By S. F. Shaw
Submergence and other factors in air and gas lift.

Causes and Effects of Crooked Holes 51
By E. J. McKee
Excessive weight considered primary reason in many cases.

Field Problems and Their Solution 77
Edited by Thomas F. Smiley

Important Factors in Pumping Wells 88-B
By Mid-Continent Committee on Production Practice, J. R. McWilliams, Chairman

Inspection and Care of Wire Ropes 88-D
By Glenver McConnell
Mid-Continent sub-committee makes exhaustive study.

Oklahoma Production, Third Quarter 101

Big Amalgamation in Oil Tool Industry 122

New Umpire in Hendricks Pool 143

FIELD OPERATIONS

West Texas 46-161
By James H. Dameron

Late Fields 47

North Texas and Panhandle 48-161
By James H. Dameron

Oklahoma 52
By J. L. Dwyer

Kansas 54
By J. L. Dwyer

North Louisiana-Arkansas 57
By D. H. Bancroft

Gulf Coast 59
By Neil Williams

Canada 59
By Victor Lauriston

Southwest Texas 60
By B. D. Stevenson

California 63
By L. P. Stockman

Eastern Fields 68
By D. S. Wakenight

Kentucky-Tennessee 68
By Whit

Central West 72
By Whit

Rocky Mountain Area 88-A
By Tolbert R. Ingram

Muskegon, Michigan 88-A

REFINING AND MARKETING

Wide Spread Exists in Gasoline Prices 36
By C. O. Willson
Difference of 1 cent a gallon in high and low of Oklahoma U. S. Motor grade. Bright stocks strong.

Properties Required in Motor Fuels 123
By Charles E. Kern
German scientists determine desirable characteristics.

Chicago Movement Mostly on Contracts 126
By J. B. Waldo
Gasoline prices above view of buyers. Distillate orders grow.

Softer Undertone to Gasoline in East 127
By Special Correspondent
Tank car market continues to hold at 11 cents.

Brief Items for Petroleum Refiners 130

Natural Gasoline Manufacture 131

Refinery and Crude Prices 132-133

Tank Wagon Quotations 134

Technical Questions Answered 138
By Dr. C. K. Francis

Of Interest to Sales Departments 146

Foreign Trend in New Motor Fuels 148
By John H. Nelson
Many experiments under way with liquid and gaseous products.

ARTICLES OF GENERAL INTEREST

The Advertisers' Index 33

Equipment and Supplies 74

Natural Gas Developments 80

Men Known in Oildom and Personals 98

Classified Want Advertisements 124-125

Oil Securities Advancing 136-137

Crude Petroleum Statistics 176

BE A REGULAR READER

The Oil and Gas Journal Tulsa, Okla.

You are hereby directed to mail The Oil and Gas Journal to me for.....year. Enclosed find remittance $.....

Classify my interests as checked by me.

.....Producing .....Refining

.....Equipment .....Marketing

Name.....

Address.....

City.....

$6 a Year

$3 6 Months

Refinery Section Starts on Page 123

Crude Petroleum Outlook Is Brighter

Highest daily average estimated total production in 1927, week ended July 30, 2,587,105 bbls. Lowest in 1927, Jan. 22, 2,360,789 bbls.

Big Demand for Sweet Oil the Dominant Factor in Situation. California Expected to Handle Own Problem

By Andrew M. Rowley

Highest daily average estimated light oil production in 1927, week ended July 30, 2,102,385 bbls. Lowest in 1927, Jan. 1, 1,790,729 bbls.

Continued improvement in the general petroleum situation throughout the United States during the remainder of this year at least is anticipated by operators. Indications now are the production trend will be upward about the first of the year, due to developments in California although the Mid-Continent sweet oil area will continue to register declines in output probably until the Mission Pool of Oklahoma is opened for production the middle of next February. The California situation is not generally regarded as the big menace it was a couple of months ago due to efforts of leaders of the industry there to formulate a definite plan for conserving natural gas in the development of the deeper zone at Santa Fe Springs which automatically will prevent producing the oil at a maximum.

There is little doubt but that there will be a substantial increase in the production of sweet oil early next year but, at the same time, it must be remembered there will be an enormous demand for this quality of crude at the same time. In fact the overproduction situation as far as it relates to sweet crude in the Mid-Continent area at least is not a problem at this time as the output of this quality of crude is and has been declining and a number of refiners are finding it difficult to procure enough sweet oil for their requirements. Light oil has been withdrawn from storage in California during the past year to the extent of 6,000,000 barrels, withdrawals in September totaling 1,500,000 barrels. This indicates the production of this quality of crude in California has not been enough for requirements of that area.

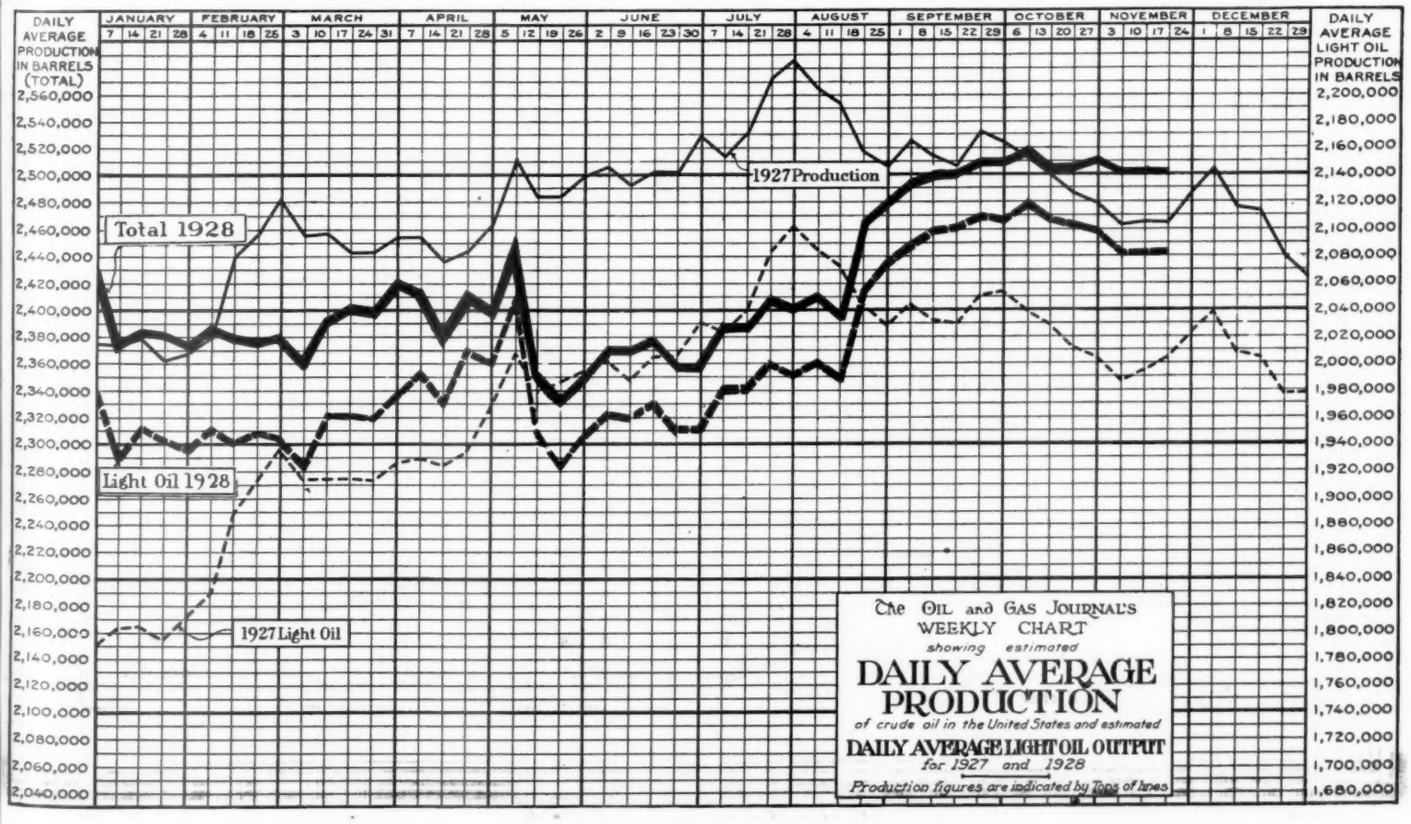
California has built up a big market for its petroleum products and that territory will be able to care for much if not all the new production expected. It is not believed the Mission Pool in Oklahoma will become a factor which cannot be handled in the Mid-Continent. Consequently, the outlook for the industry as a whole appears much brighter and, as one oil company executive said in speaking of higher crude oil prices: "It won't be long now."

PRODUCTION IN THE UNITED STATES

Estimated daily average production of light and heavy gravity oil in the United States for week ended November 17, and a comparison with the previous week follows:

	Nov. 17		Nov. 10	
	Light	Heavy	Light	Heavy
Oklahoma—				
Tonkawa	11,715	.....	11,955	.....
Burbank	25,480	.....	25,830	.....
Other Osage Fields	26,020	.....	26,115	.....
St. Louis-Pearson	128,815	.....	129,045	.....
Cushing and Shamrock	20,135	.....	20,140	.....
Bristow	20,440	.....	20,585	.....
Allen	22,955	.....	23,415	.....
Seminole	294,880	.....	299,420	.....
Northern Miscellaneous	108,570	.....	109,140	.....
Southern Fields	56,265	.....	55,735	.....
Total Oklahoma	715,275	.....	721,380	.....
West Texas—				
Hendricks	150,221	.....	144,392	.....
Yates	71,486	.....	70,951	.....
Remainder	116,120	.....	114,904	.....
Total West Texas	337,827	.....	330,247	.....
North Louisiana	32,535	6,220	33,030	6,385
Arkansas	29,330	54,050	28,630	54,550
North Central Texas	143,492	.....	143,258	.....
Texas Panhandle	65,655	.....	65,100	.....
East Central Texas	22,197	.....	22,418	.....
Kansas	96,210	.....	96,690	.....
Total Mid-Continent Area	1,442,521	60,270	1,440,753	60,935
Gulf Coast	.....	131,674	.....	135,045
Southwest Texas	.....	31,370	.....	29,020
Eastern	114,000	.....	116,000	.....
Rocky Mountain Area	81,894	.....	83,842	.....
California—				
Santa Fe Springs	55,000	.....	50,000	.....
Long Beach	186,000	.....	188,000	.....
Torrance	2,000	13,750	2,000	14,000
Huntington Beach	50,750	.....	51,000	.....
Elwood	10,000	.....	5,350	.....
Inglewood	16,500	11,000	16,500	10,500
Ventura Avenue	53,000	.....	52,000	.....
Seal Beach	26,000	.....	25,000	.....
Remainder of State	52,000	167,500	57,650	168,250
Total California	451,250	192,250	447,500	192,750
Total United States	2,089,665	415,564	2,088,095	417,750
Grand Total		2,505,229		2,505,845

Total Decrease, 616 Bbls.; Light Oil Increase, 1,570 Bbls.



Wide Spread Exists in Gasoline Prices

Difference of 1 Cent a Gallon in High and Low of Oklahoma U. S. Motor Grade. Bright Stocks Strong

By C. O. Willson

The trend toward wide spreads in refinery gasoline prices in the Oklahoma (Group 3) market continued during the past week. For the U. S. Motor grade the spread effective on Tuesday was approximately 1 cent. A few scattered sales were reported direct to the jobber trade at 9½ cents and at the same time resale material sold as low as 8½ cents. These sales represented the extremes in quotations.

A majority of the larger refiners were quoting 9¼ cents to their jobber customers for U. S. Motor gasoline. Brokers at the same time were able to cover their requirements at 8¾ and 9 cents resulting in a condition in which offers to the jobbing trade covered a price range of at least one-half cent.

Some export business, the bulk of which was placed with the North Texas refiners aided the higher gravity grades of gasoline. The export business was for 390 and 375 endpoint material. The domestic demand for these products also is relatively strong so that the market on these higher gravity grades was stronger than in the case of U. S. Motor gasoline.

Natural Gasolines Lower

Natural gasoline prices declined from one-half to seven-eighths cents per gallon during the week. Some buying on the part of large manufacturers the latter part of last week stopped a rapid slump in prices and prices were firmer the first two days of this week.

Of the five grades of natural gasolines, Grades A and AA are the strongest. There was very little demand for the B, BB and C grades the first of the week and some substantial buying in these grades will be necessary before the end of the week if present prices are to be maintained. The apparent weakness in the refinery U. S. Motor gasoline market is held responsible for the lower natural gasoline prices by the manufacturers. Many refinery buyers of natural gasoline have been forced to store a part of their output and this has tended to reduce their current purchases from the manufacturers. The larger manufacturers have considerable empty storage at their plants but in most cases they are moving their output currently, a situation which is reflected in almost daily changes in quotations.

The fuel oil and distillate market very closely resembles the gasoline situation so far as range in prices is concerned. The Oklahoma market on the bulk of the fuel oil material available remains weak, but there are numerous cases in which the sellers are obtaining premium prices for grades meeting the special requirements of buyers.

Grades which have to meet the competition of West Texas fuels are sluggish and have sold as low as 50 cents a barrel in Oklahoma during the week. Refiners in a position to offer a zero cold test fuel of the desired viscosity with a minimum of sulphur content are able to obtain a premium of from 5 to 10 cents a barrel.

This situation is particularly true of the higher gravity grades. Some domestic burners now on the market can use a 26-30 or 28-30 gravity fuel oil provided the specifications just mentioned are satisfactory with no objectionable odor. A few refiners are able to make this material by blending a rerun gas oil from their cracking plants with a residuum product from their skimming plant. Various shifts in manufacturing methods have been devised to obtain these premium grades of fuel oil.

Largely the same situation applies in the case of gas oil and distillates. There is a strong demand for the zero grades of gas oil with low initial boiling point suitable for domestic burners. These grades preferably should have a straw color and minus a strong odor.

In the regular grades of distillates the refiner who can furnish a grade having an initial under 190, a low cold test, straw color and sweet has no difficulty selling his product. One Oklahoma refiner selling a 38-40 gravity treated product is obtaining 4 cents a gallon for his entire output. Unfortunately from the standpoint of the sellers it is impossible for most of them to furnish these superior grades of distillates without a sacrifice in yields of other products.

These refiners prefer to take the low of the market for these heavier products rather than sacrifice their yields of light endproducts such as gasoline and kerosene.

As has been the case for several

(Continued on Page 129)

REFINED MARKET BAROMETER

A trend toward lower gasoline prices was reported in practically all refining areas east of California during the past week. The softness apparently was a development of the seasonal decline in domestic consumption coupled with a continued high rate in refinery production. Natural gasoline prices in the Mid-Continent slumped one-half to three-fourths cent during the week. Kerosene and distillate prices were generally firm despite the 2-cent reduction in Ohio tank wagon kerosene prices. No important price changes in fuel oil and gas oil developed. In the lubricating oil list bright stocks and cylinder stocks are generally strong and price advances have materialized at several points. Wax prices are unchanged.

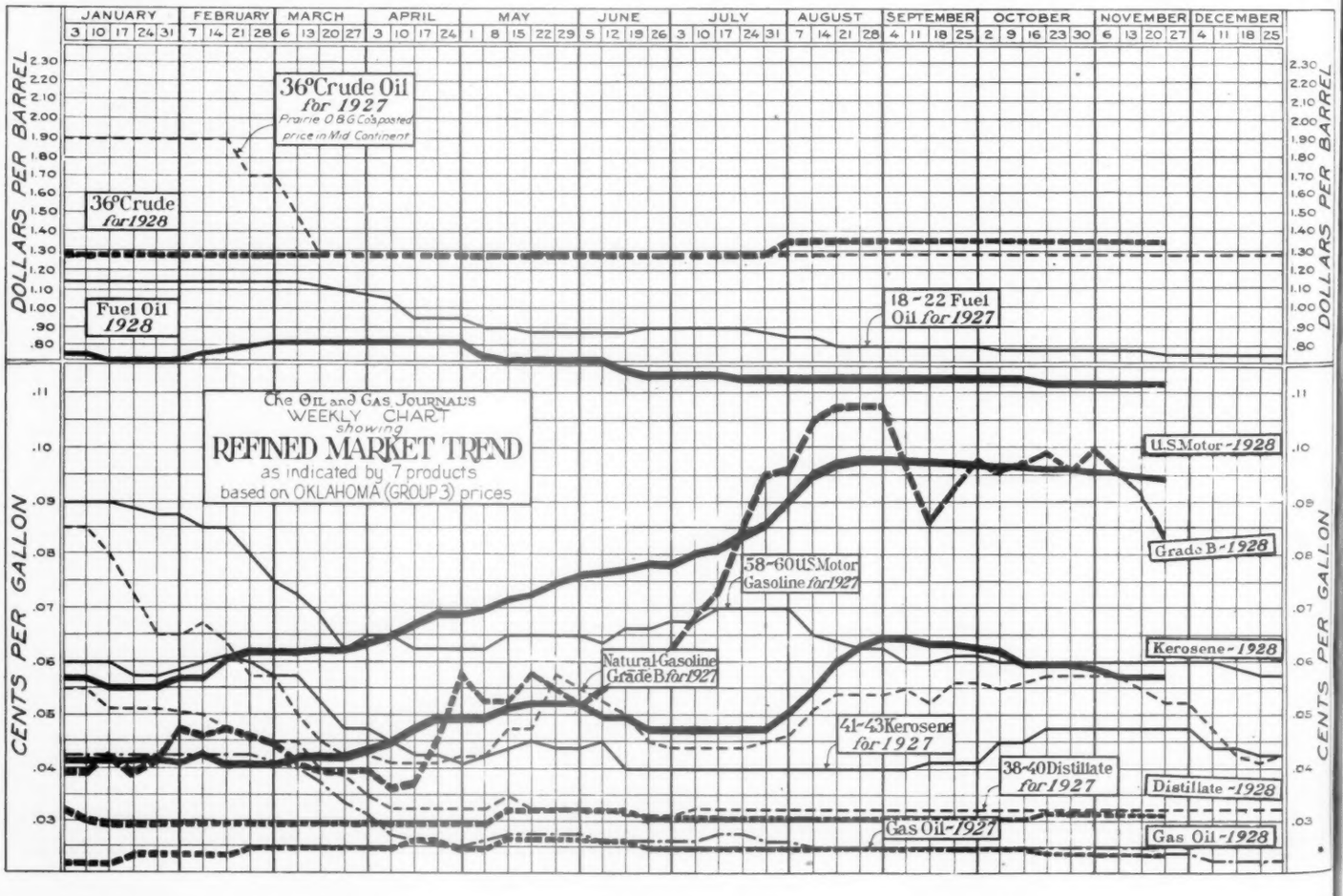
Mid-Continent—Weakness in gasolines was reported in all areas with a wide range in prices. All grades of natural gasoline reduced. Fuel oil and gas oil weak and prices lower in North Louisiana and Arkansas. Kerosene unchanged. Bright stocks strong and prices higher.

East Coast—Gasoline soft. Bright stocks higher. Kerosene well maintained. Other products unchanged.

Pennsylvania—All grades of steam refined stocks higher. Bright stocks strong. Gasoline movement slow.

Gulf Coast—Better demand for neutral oils. Fuel oil sluggish.

Chicago—Gasoline prices lower. Kerosene slow. Furnace distillates in strong demand. Fair demand for fuel oil and gas oil.



Big Drilling Campaign on at Mission

Nearly $5,000,000 Being Spent for Present Operations. Wells Will Not Be Produced Until February 15, 1929

By J. L. Dwyer

The Mission Pool of the Greater Seminole region is now the scene of the largest drilling activity which the Mid-Continent Field can boast, and since November 15, the date upon which wells were permitted to spud, there have been numerous changes made in the active operations announced by the companies owning leases in this sector.

At this time there are 71 tests drilling to the Wilcox sand, and these operations represent an expense of $4,970,000 in drilling costs alone, for it is estimated that $70,000 will be the average cost of drilling a well in the Mission area. If the majority of the wells produce, this figure must be increased substantially for the $70,000 does not take account of the cost of equipping the wells for air lift, or construction of tankage or any other costs of production.

The most favorable circumstance of this development is the orderly manner in which the potentialities of the pool are being tested, and the lack of the wild drilling orgy which has characterized so many of the Greater Seminole pools. While there is naturally a scramble upon the part of the lease owners to get their wells completed first, this phase will be largely eliminated under the terms of the agreement reached by the lease owners who have set February 15, 1929, as the date upon which the wells may be drilled into the Wilcox sand. This allows 90 days as the drilling time for the wells, and it seems reasonable to assume that it will be ample to provide for the completion of the wells, as it is considerably above the average drilling time necessary in this part of the Greater Seminole area.

Under the terms of an agreement reached by the lease owners of this region, only two wells to each 40-acre tract of lease have been started at this time. The accompanying map shows the latest locations and drilling wells. Since some companies have announced more than two locations to the 40-acre tract of leases (but only two wells started) the map shows all four locations made upon the 40-acre lease of the Minnehoma Oil Co. described as the NW NW, Section 7-8-6. The tract owned by the Independent Oil & Gas Co. and the Kistler Oil Co. also shows all four locations made, but these companies, like the Minnehoma, will drill only two wells to each 40-acre tract of lease.

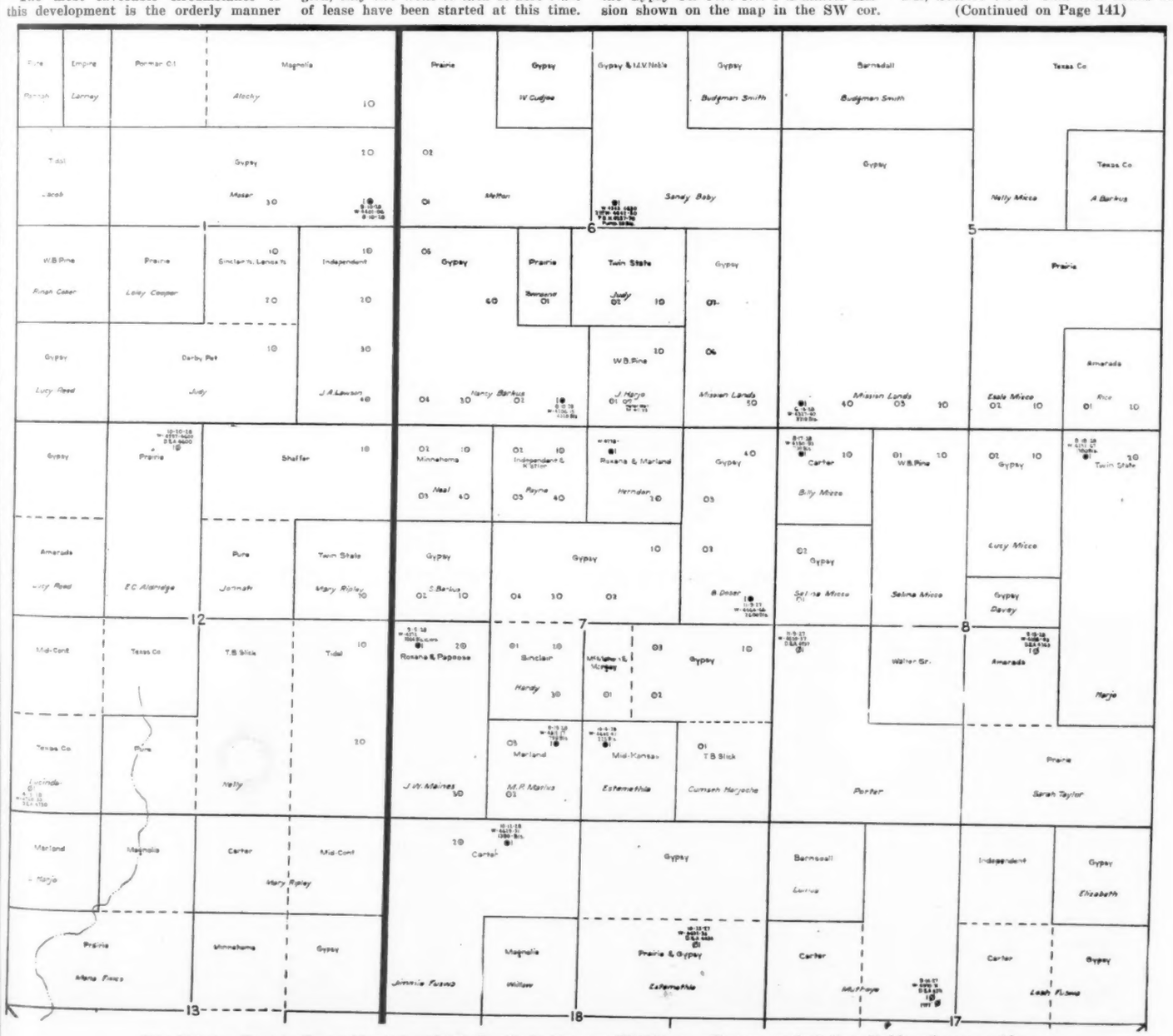
Under the terms of the Mission agreement, the remaining two locations may be started January 15, 1929, and it is estimated that at that time, some 72 additional wells will be started in the Mission area.

This region first attracted notice when the Gypsy Oil Co.'s No. 1 Seminole Mission shown on the map in the SW cor. SW, Section 5-8-6, found the top of the Viola lime running very high. Compared to the Viola as found in the wells east of the Mission well (towards the Bowlegs Field,) the lime was found almost 200 feet high. This occurred at a time when the Oklahoma crude market was incapable of absorbing any more crude, and had the Mission region been thrown wide open to the drill at that time a greater demoralization of the crude market would have been the consequence.

While not sure of having production in the Mission well, but believing that the Viola's position gave the well more than favorable chance for oil production in the Wilcox horizon, the well was shut in when the owners of adjacent leases agreed to start no operations.

Some time later, the Gypsy Oil Co. drilled in its Doser well in the SE cor. NE, Section 7-8-6. This well found the

(Continued on Page 141)



The Mission Pool in Townships 8-5 and 8-6, Seminole County, Oklahoma. Heavy vertical line divides the townships.

Oil-From-Coal Processes Gain Ground

Mr. Teagle Tells Bituminous Coal Conference Importance of Industrialization Cannot Be Overestimated. Methods Discussed

By Special Correspondent

PITTSBURGH, Pa., Nov. 20.—Dr. Carl Krauch, director of the great German dye trust, the I. G. Farbenindustrie, was the principal speaker at the first day's session of the second International Conference on Bituminous Coal which opened here Monday morning at the Carnegie Institute of Technology. About 2,000 delegates had registered by 10 o'clock when Dr. Thomas S. Baker, president of the institute, formally opened the six-day world congress with an address of welcome to the delegates.

Doctor Krauch, who only a few years ago was a laboratory assistant in the chemical department of the University of Heidelberg, spoke on "Catalysis Applied to the Conversion of Hydrocarbons." He was introduced by W. C. Teagle, president of the Standard Oil Co. of New Jersey, who described the I. G. Farbenindustrie as an outstanding example of the union of science and industry, from which union, said Mr. Teagle "has sprung an economic development, the potential importance of which can hardly be overestimated. This development is the industrialization of the process of converting coal into oil."

The I. G., according to Doctor Krauch, now has in operation an extensive plant for the production of gasoline, the annual production of which amounts to about 70,000 tons. It is planned to increase this by the end of next year to about 250,000 tons. This gasoline has found a ready market because in all essential properties it equals a good gasoline obtained from crude oil in the ordinary way, the speaker asserted.

Catalysts, Doctor Krauch said, are for the industrial chemist the most important means of overcoming the impediments generally resisting the course of chemical changes. The speaker described as cases of catalytic conversions of hydrocarbons worked out in recent years by his company the hydrogenation of ethane to ethylene; the splitting up of ethane either into its elements or into acetylene, ethylene, etc.; the polymerization of acetylene to a liquid rich in benzene, and cracking of oil products and tars. Describing the catalytic hydrogenation of crude oil and coal and their distillation products, Doctor Krauch told of the many difficulties the I. G. had to face in the technical and commercial development of these processes and how these difficulties were overcome.

Hydrogenation Processes

This hydrogenation of crude oil and tar, Doctor Krauch described as carried out industrially in the following ways: (1) In form of a fine spray, conducted over the catalyst, or (2) vaporized, or (3) in the liquid phase.

"Coal may similarly be hydrogenated in the form of powder distributed in hydrogen or suspended in a suitable high boiling point," said Doctor Krauch. "If gasoline is to be obtained as the main product, it is advisable to transform the coal first into a middle oil, then working it up further into the gas phase. The high boiling oil resulting in the first stage must be separated from the ash contained in the coal and from the coal particles not liquefied. To carry through this separation in a technically satisfactory way was one of the most difficult tasks of the whole process."

A paper by Rudolph Pawlikowski, of Gorlitz, Germany, read before the pulverized fuel section Monday afternoon, described his internal combustion engine which uses pulverized coal for fuel. The new motor introduces the coal dust into the cylinder by an antechamber, which works on the principal of a sluice. The coal dust is brought into the chamber at approximately atmospheric pressure, then the chamber is closed, charged with compressed air, and the coal dust is blown out into the cylinder. Unlike the Diesel engine it compresses air and fuel simultaneously. However, it keeps them separated until the end of compression and until injection. The engine may be started on coal alone or on oil, and can be switched quickly and easily from one to the other fuel during operation.

The following are brief synopses of papers of special interest to the oil industry which are scheduled for the week:

WEDNESDAY

Liquefaction Section

"Some Aspects of the Hydrogenation of Coal," J. Ivon Graham, assistant director, mining research laboratory, University of Birmingham, Birmingham, England. The paper gives a resume of the research on the high-pressure hydrogenation of coal, carried out during the past five years in the mining research laboratory of Birmingham University, under the supervision of the author. The paper also discusses the action of hydrogen upon cokes prepared at 430 degrees Centigrade; the yield of oil from Boghead cannel and black cannel coal.

"Hydrogenation of Tar and Asphalt," G. Hugei, professor Ecole Nationale Superieure du Petroleu et des Combustibles Liquides, Strasbourg, France. The paper presents a study of hydrogenation of coal tar from the particular angle of the hydrogenation of solid combustibles. The Bergius process of hydrogenation under high pressure without catalyzers is shown to be applicable to coal tar.

THURSDAY

Liquefaction Section

"The Hydrogenation of Organic Substances at High Temperatures and Under High Pressure in Presence of Non-hydrogenating Catalyzers," Andre Kling, director Laboratoire Municipal de la Ville de Paris; Daniel Florentin, chemical engineer and assistant director Laboratoire Municipal de la Ville de Paris. The catalyzing agents employed in the investigations described in this paper are divided into two classes: (1) Catalyzing substances with additive action by substitution and depolymerization, and (2) catalyzing agents with hydrating action. The principles described in this paper have been developed to an industrial stage.

Daniel Florentin, chemical engineer and assistant director Laboratoire Municipal de la Ville de Paris.

The paper deals mainly with oxidation experiments made with hydrocarbon pentane mixed with air. Various mixtures of pentane and air were heated with a pressure bomb and the point at which autoignition and pressure increase occurred was determined. In addition, the effect of tetraethyl was studied in the same connection. Similar tests were made with benzine.

Low Temperature Distillation Section

"Low Temperature Distillation, the British Coal Industry and Oil Supplies," R. H. Crozier, manager Mineral Oils Extraction, Ltd., London, England. The importance of low-temperature distillation to Great Britain is shown. The author discusses the modern trend toward reor-

(Continued on Page 141)

CHEMIST ENDS THREAT OF WAR OVER OIL

PITTSBURGH, Pa., Nov. 20.—The chemist has ended the possibility that nations will go to war over the diminishing supply of the world's petroleum, Walter C. Teagle, president of the Standard Oil Co. of New Jersey, declared in an interview at the Second International Conference on Bituminous Coal at the Carnegie Institute of Technology, being held here this week. Synthetic gasoline developed by the Bergius and other oil-from-coal processes will meet any shortage in natural petroleum supplies that may occur, Mr. Teagle said. His company has acquired the American rights to the Bergius process from the German dye trust.

"There is no likelihood of a shortage of oil," Mr. Teagle said, "for large new supplies of natural petroleum are being discovered. Estimates of the amount of natural oil given before the Federal Oil Conservation Board in Washington in 1926 would be greatly increased today. And, in addition to the deposits of liquid crude oil which are now shown, there is the new process of making oil from coal. Synthetic oil from coal naturally will be more expensive to produce than liquid crude oil, but it will supplement the latter if need should arise."

MEMBERS MID-CONTINENT DISTRICT, A.P.I. DIVISION OF DEVELOP

Committee Will Study Crooked Holes

Mid-Continent District Engineers Decide on Exhaustive Investigation at Fall Meeting. Constructive Papers Read

By Thomas F. Smiley

Crooked holes, concerning the cause of which and the remedy for them there is wide divergence of opinion, will be the subject of a searching investigation covering major oil fields of the entire country as a result of action taken last Friday at the fall meeting of the Mid-Continent district of the American Petroleum Institute Division of Development and Production Engineering in the Mayo Hotel, Tulsa. C. D. Watson, Carter Oil Co., chairman of the Mid-Continent district, and E. J. McKee, Phillips Petroleum Co., chairman of the Drilling Practice Committee, in a motion adopted were directed to appoint a committee to study the whole question of crooked holes—their cause, drilling and production troubles created by them, and measures for their prevention—and report back to the district organization.

The motion, which was presented by J. R. McWilliams, Skelly Oil Co., chairman of the Production Practice Committee, was in conformity with a suggestion made by Mr. McKee in the paper prepared by him and his committee on "Crooked Holes, Some Causes and Effects."

The 150 engineers from throughout the Mid-Continent area who attended the meeting expressed gratification over the day's program arranged by Mr. Watson and W. K. Whiteford, Barnsdall Oil Co., secretary, which included two papers at the forenoon session, two in the afternoon and a banquet in the evening. In welcoming the engineers Mr. Watson outlined the purposes for which the Division of Development and Production Engineering was created last spring. He said:

"This division of the American Petroleum Institute was authorized as an instrument through which the producing side of the business could come together to discuss ideas and methods that will better serve the industry and, of course in the final analysis, what is good for the industry is usually good for the individual operator.

Great Step Accomplished

"The Standardization Division of the American Petroleum Institute has accomplished a great step forward in the work which it has done in the past six years. This work is not finished and cannot be finished if we are to progress. However, the basis of standardization of oil field equipment has been accomplished and these standards have been given to the manufacturers and operators.

"The Development and Production Engineering Division is interested in the utilization of these standards in the field. It is also interested in the developing of new and better methods of drilling and producing, and in the possible improvement of the methods and devices that are now in use.

"Pioneering is necessary in every industry and it has certainly been done many times in our industry. However, after certain methods and habits have been fairly well established, any deviation or change in those methods are looked upon with skepticism and must be entirely proven before they are generally adopted.

"Examples of this are the substitution of steel wire lines for rope lines; the rotary method; the evolution of the all-steel derrick; the gas lift and more recently the gas-o-lift which combines, in a measure, the lifting of oil with the extraction of gasoline. And who can say, but that in the future a greater and more economical recovery can be had by adding repressuring to the present double duty of these plants?

Many Problems to be Worked Out

"However, there are surely many problems that are to be worked out which involve our present methods and these are the ones that immediately concern the operator. The operator is always interested in getting the most oil out of his well at the lowest possible lifting cost and since the increasing number of crooked holes has added to our pumping troubles, any light that can be had on the prevention of crooked holes, should be interesting.

"The results of selection and care of the material which the operator buys show in the balance sheet, whether he sees it or not and when this material is as important as wire lines we are surely interested in the best way to judge a wire line for a given purpose that will give the longest lift at the least cost.

"The question of gas consumption and the problem of how to develop new pools with the least waste of gas energy and with the highest ultimate recovery, surely necessitates that we learn more about sand pressures and the best way to control these pressures in order to best utilize the gas energy.

"Of course this meeting cannot solve all of these problems, but it is hoped from the discussion of the papers presented here, that all of us can carry some ideas back to the job, that will justify the discussion."

Young Explains Origin of Division

Preliminary to the reading of papers Mr. Watson introduced C. A. Young, Dallas, Tex., executive secretary of the American Petroleum Institute, who told how the Development and Production Engineering Division had been formed in response to a demand from producers for scientific help in solving its problems. Six hundred members already were enrolled, he said, and the interest manifested in the seven district meetings held thus far showed there was a real place for the division.

"As time goes on," he said, "with the steadily increasing standardization of oil industry equipment, we shall come to accept standards as a matter of course." An industry must keep step with other industries, Mr. Young pointed out, adding: "The oil industry must keep step with the advancement in other industries."

In his paper on "Crooked Holes" Mr. McKee said it had not been prepared with the idea of offering a cure-all, but in the hope of emphasizing the importance of their effect on the oil industry so that a comprehensive study of their causes and effects might be made. The discussion which followed the paper touched on the part played by mud of proper consistency, by adequate equipment kept in first class condition and by intelligence on the part of the driller. Excessive weight on the cutting tool and excessive rotating speed were mentioned as among probable causes of crooked holes and the need of starting the hole straight was pointed out.

"We don't know what makes a hole crooked," declared Russell S. Knappen, of the Gypsy Oil Co. "It may be the rate of rotation. It may be too powerful pumps and too much circulating fluid, allowing the bit to wander around in the hole. I don't believe it is caused by geological conditions or by too much weight on the drill stem." Mr. Knappen said that the experience of his company with devices and processes designed to insure straight, or relatively straight, holes had led him to believe that the

(Continued on Page 94)

WOULDN'T HAVE TO LOOK ANY FURTHER

Speaking of the folly of oil producers in sacrificing legitimate profits through their failure to cooperate, Harry H. Smith, secretary of the Mid-Continent Oil & Gas Association, perpetrated this one at the banquet of the A.P.I. Division of Development and Production Engineering in the Mayo Hotel, Tulsa, last Friday night:

"Three university men were taking a trip around the world. In Jerusalem they encountered a voluminously bearded resident. In merry mood the Harvard man said, 'Aha, here comes Abraham!' The Yale man protested, 'No, it's Isaac.' 'You're both wrong,' asserted the Princeton man. 'It's Jacob. Hello, Jacob!' So the three, explaining their inability to agree, asked the venerable citizen of Jerusalem, who had something besides whiskers, to tell them who he really was.

"'I am Saul, the son of Kish,' was the answer, 'and I seek my father's asses. Evidently I have found three of them.'

"If that same patriarch were to survey the oil men of this country today, feverishly drilling into the earth at enormous expense to get something to give away, he surely would exclaim, 'My search is ended! I have found the rest of my father's asses.'"

ND PRODUCTION ENGINEERING, MEETING AT TULSA, NOVEMBER 16

—Copyright, 1928, The Oil and Gas Journal.

Overproduction in the Fuel Oil Era

Problems That Beset the Industry From Spindletop to Cushing. Conditions Not Cured Until After Bitter Experience

By Ernest R. Lilley, Sc.D.*
Associate Professor of Geology at New York University

Throughout the development of Pennsylvania and other eastern states during the nineteenth century more than 50 per cent of the products sold by refineries consisted of kerosene and other burning oils. In 1899 the percentage was 57.6 per cent. In the same year 9.1 per cent was sold as lubricating oil and 10.7 per cent as gasoline and naphtha. Undoubtedly a much higher percentage of the latter products could have been secured if the market could have absorbed it. However, as the demand for kerosene was greater than that for gasoline and naphtha, the refiner made his cuts to secure the maximum quantity of the former. The percentage of fuel oil secured was only 14 per cent and is in marked contrast with the totals of nearly 50 per cent that refiners have reported in the past 15 years. This remarkable difference is due in part to the fact that the oils of the Appalachian and Lima fields were particularly suited to the production of large amounts of burning oils, and in part to the location of those fields in areas where coal of high quality was abundant and its mining a well established industry. Only once, in 1888, when it was feared that the sulphur in the crude of the Lima section would prevent its use in making kerosene, did producers seriously consider the displacing of coal by fuel oil on a large scale. Thus when the heavy oils of the Gulf Coast and of the Valley Field of California were brought on the market at the opening of the present century, it became necessary to make a market for them in much the same way as a market had been developed for kerosene.

New Fuel Oil Era

The well that may be said to have marked the opening of this new fuel oil era was the famous Lucas gusher completed at Spindletop on January 10, 1901. The well came in out of control. No equipment to handle such a well was on hand. Nothing like it had ever been seen in America. It flowed a stream of oil 160 feet into the air for nine days before it could be capped. Its production has been estimated at 75,000 bbls. daily; but, as much of this was lost in seepage from hastily constructed dirt storage basins, no accurate statement is possible. Further losses were caused by a fire started by the spark of a passing locomotive.

The producers realized that the oil was not comparable with Pennsylvania oils for refining and that little profit could be expected if it were handled in the same manner as the oils of that State were. However, the short distance to a deep-water harbor and the scarcity of coal in the adjacent areas immediately created expectations of great profits to be made by the sale of the oil either directly or after a little refining to railroads, steamships, and industrial plants as a boiler fuel. By the first of July the boom was in full progress. A number of speculative companies had been organized. Excursions were run from distant points to impress the potential stockholders with the wonderful possibilities. Within an area of 80 acres surrounding the discovery 14 producing wells had been completed, together with three dry holes. There were also in the same radius 15 drilling wells and 18 rigs. In Jefferson County, the site of the discovery, 211 active tests had been started within six months of the completion of the Lucas gusher.

THE GULF COAST FIELD
Production and Price Statistics, 1901 to 1910*

	Yearly production in bbls.	Average price per bbl.
1901	3,593,113	$.175
1902	18,014,404	.209
1903	18,371,383	.411
1904	24,631,269	.357
1905	36,526,323	.240
1906	20,524,162	.457
1907	16,360,299	.827
1908	15,772,137	.603
1909	10,883,240	.723
1910	9,680,465	.763

*After United States Geological Survey.

The oil was found in a porous dolomitic limestone at depths varying from 960 to 1,050 feet. Drilling was done rapidly with rotary outfits and most of the early completions flowed readily because of high gas pressure. By the close of 1901, 138 wells had been completed. Only 55 were actually shipping. A few had come in dry or with unprofitable yields but the majority were shut down because of lack of facilities to ship the oil. Actual expenditures during the first year for drilling, producing and transporting equipment were estimated at $4,000,000. More than 6,000,000 bbls. of oil had been produced. A quarter of that was in storage; 1,000,000 bbls. had been lost by fire; and the remainder, about 3,500,000 bbls., had been sold at an average price of 17½ cents a barrel.

Sour Lake and Jennings

Sour Lake and Jennings added their quota in 1902 bringing the production of the Gulf territory to nearly 18,000,000 bbls. as a result of the intensive wildcatting campaign that had been initiated by the Spindletop discovery. The market was eagerly taking the oil, its advantages over high-priced coals being recognized almost immediately. However the absence of shipping facilities prevented the shipping of more than 60 per cent of the production and the average price at Spindletop only rose 3 cents a barrel. The Batson Pool was discovered in 1903, but its development began too late in the year to have any effect, the production of the field as a whole remaining the same as during the previous year. Shipping facilities caught up and the price of crude oil doubled.

The development of Batson, together with the discovery and development of major pools at Humble and Saratoga, in 1904 and 1905, brought the production even beyond the needs of a rapidly expanding market. Prices sank almost to the level of 1901 and 1902 but soon rebounded as the flush yield of these pools began to decline. By 1907 oil was at a premium and sold for approximately 84 cents a barrel. Prices declined somewhat during the next few years under the influence of shipments from Oklahoma and northern Louisiana. However, a market for fuel oil had been developed on the coast and producers adjacent to it enjoyed the advantage of low transportation rates. Gulf oil has never commanded the prices paid for crudes having high percentages of gasoline but the size of the market to which it has catered has freed it from the abrupt price changes which have characterized many fields.

VALLEY FIELD, CALIFORNIA
Production and Prices, 1898 to 1913*

Year	Kern County Product'n in bbls.	Kern County Aver. price	Coalinga Dist. Product'n in bbls.	Coalinga Dist. Aver. price
1898	10,000	....	70,000	.....
1899	15,000	....	154,000	.....
1900	892,500	....	532,000	.....
1901	4,493,455	....	780,650	.....
1902	9,705,703	$.247	572,498	$.45
1903	18,077,900	.21	2,138,058	.33
1904	19,608,045	.175	5,114,958	.297
1905	14,487,967	.186	10,967,015	.24
1906	14,520,804	.23	7,991,039	.231
1907	15,652,156	.275.	8,871,723	.3485
1908	18,132,893	.482	10,386,168	.519
1909	23,219,494	.526	14,478,181	.571
1910	37,896,727	.424	18,387,750	.497
1911	45,921,712	.414	18,483,751	.492
1912	50,245,255	.406	19,911,820	.441
1913	58,278,966	.445	19,302,654	.442

*After United States Geological Survey.

California Contribution

At the same time as Spindletop was creating an interest in fuel oil along the Atlantic and Gulf Coasts, the Valley Field was performing a like duty in California. Oil had been known in that State for many years. A production of more than 2,000,000 bbls. had been built up by 1899. Practically all of that came from points along the coast in Santa Barbara, Ventura and Los Angeles Counties. The reader who remembers the sensational developments of the past few years in the coastal area may have difficulty in understanding the failure to develop this area on a large scale at an earlier date. The shallow wells of the nineties were small and their oils were of low quality. They could not be used in the development of a refining industry like that of the East and their cost did not encourage their use on a large scale in place of coal.

Coalinga, in Fresno County, in the San Joaquin Valley, was found to contain oil in 1890. However, the section was only sparsely populated and transportation facilities were poor. A little work was done but real development did not begin until 1897. The oil was sent out by tank cars making it difficult for operators to compete with the shallow but short-lived producers that had been developed in a town lot drilling campaign in Los Angeles. In 1898 the existence of commercial quantities of oil in the Kern River area of Kern County was proven. Immediately afterward, the possibilities of Midway, Sunset and McKittrick were outlined. Although wells differed widely in rate of production, operators realized by 1900 that there was an abundance of oil in the valley sections and that the chances of drilling dry holes were materially lower than in the eastern fields.

Checkerboarding

A large percentage of the land in the areas that were considered potentially productive was owned by the Santa Fe and the Southern Pacific Railroads. This should have served to prevent the development of any offset drilling campaigns such as had characterized the development of the eastern and Gulf Coast pools.

(Continued on Page 167)

*This is the second article in a series written especially for The Oil and Gas Journal by Ernest R. Lilley, Sc.D., associate professor of geology at New York University, leader of the oil executives' course at the Wall Street division of the university, and author of "The Oil Industry" and "The Geology of Petroleum and Natural Gas."

OIL CONSERVATION LEGISLATION IN HANDS OF A LAW COMMITTEE

A forward movement in the interest of oil and gas conservation was made within the past week at a conference of the Mineral Section of the American Bar Association at Wichita, Kans., November 13 and 14. Those in attendance at the session were Former Senator Chester I. Long, Wichita, Kans., chairman; James A. Veasey, Carter Oil Co., Tulsa; D. M. Kelly, Anaconda Copper Co., Butte, Mont.; Paul Gregg, Union Oil Co., Los Angeles, Calif.; John Gray, Coeur d'Alene, Idaho, and James M. Finley, Empire Companies, Bartlesville, Okla. This committee was appointed by the American Bar Association to cooperate with the Federal Oil Conservation Board in formulating and suggesting needed legislation to promote conservation in the oil industry. Guerney E. Newlin, president of the American Bar Association, and Earl Evans, attorney for the Standard Oil Co. of Indiana, were also present.

The conference adopted a resolution providing that the chairman of the committee be authorized and directed to appoint a subcommittee of four from the membership of the committee to prepare suggestive legislation covering the subjects of conservation of oil and gas and co-operative development and operation of pools, the legislation to be in such form as to fully protect the public interest and at the same time permit the petroleum industry as much freedom of action in the production of oil and gas as the peculiar nature of the business demands and as shall be consistent with the major purpose of conserving the oil and gas resources of the country.

The subcommittee appointed by the chairman to immediately go to work on the formulation of a suggestive bill consists of James A. Veasey, chairman; James M. Finley, Dean Henry M. Bates of Ann Arbor, Mich., and Paul Gregg. The subcommittee will make its suggestions to the full committee within the next few weeks and if the full committee agrees upon a measure it will be submitted to the various associations of the oil industry and members of the council of the American Bar Association. If the oil industry accepts the measure as constructive and beneficial it will be presented to the Legislatures of each of the oil-producing States which assemble in January.

The resolution in full as adopted by the committee was as follows:

Whereas, Among other duties imposed upon this committee by the Mineral Sections of the American Bar Association, at the meeting of the section at Seattle, Wash., in July, 1928, was the specific direction to study the necessity for the enactment of uniform legislation in the important oil-producing states, covering two subjects:

First. In the interest of conservation to permit agreements among producers of oil and gas to restrict drilling and curtail production during periods of overproduction, the public interest to be protected in the drafting of any such legislation, and also to permit agreements among such producers to prevent waste and to develop and operate single pools according to a unit or co-operative plan. The object of such agreements being to conserve wasting natural resources and to enlarge the recoverable quantity thereof.

Second. The providing by statute in such states for the co-operative development and operation of single pools for the purpose of preventing waste and promoting the conservation of oil, gas and gas energy, the latter substance being the chief agency in the production of oil; and this committee being further empowered to formulate specific legislation covering these subjects, if in their judgment such legislation is either necessary or especially desirable.

And, Whereas, The committee having considered these questions in the light of the present practices of the petroleum industry in producing oil and gas, the statutory law of such states in relation thereto, and from the further viewpoint of the vital importance of conserving

(Continued on Page 141)

California Natural Gasoline Meeting

President Ratcliffe Describes Present Conditions in Industry. Dr. G. G. Brown Addresses Pacific Coast Association

By L. P. Stockman

LOS ANGELES, Calif., Nov. 17.—The California Natural Gasoline Association climaxed its two-day fall meeting with a banquet and entertainment at the Biltmore Hotel in Los Angeles and 606 members and guests enjoyed the festivities. Dr. George Granger Brown, professor of chemical engineering, University of Michigan, and director of research for the Natural Gasoline Association of America, occupied the entire second day and his address on the "Value of Natural Gasoline to the Refiner in Blending Finished Motor Fuels" was of unusual interest. Doctor Brown supplemented his address of last year by dealing with the effective volatility of motor fuels, the correlation of vapor pressure of motor fuels with Engler distillation and the cause and effect of gas-lock experienced in the operation of motor cars with certain motor fuels. Doctor Brown, who has just conducted a two-year research program under the auspices of the Natural Gasoline Association of America, covered all these subjects in a very comprehensive address.

The first paper presented before the meeting was a committee report covering the different vapor pressure test methods now in use for testing the vapor pressure of natural gasoline. Comparisons of different methods were made and checks made by the calculated vapor pressures by analysis. A great amount of work has been done by the committee and important points were brought out showing the necessity of accurate work. The report was presented by J. C. Bolinger of the General Petroleum Corp.

The "Determination of Vapor Pressure of Natural Gasoline," a paper prepared by the Vapor Pressure Committee, presented by H. M. Wade of the J. A. Campbell Co., described experimental work done by several member companies during the past year and indicated the lines along which such work is now progressing. Two methods have been used as absolute checks against various types of practical vapor pressure testing instruments: namely, computation from careful analysis and comparison with a very large bomb with a very small vapor space.

Fair agreement is found between two new methods and these absolute standards. A short description was given of three commonly used methods and certain weaknesses of these methods were discussed. The two new methods were described. The results of a large number of comparative tests between the three existing methods and the two new ones were presented and the differences discussed. The work to date indicates that a more generally satisfactory method of measuring vapor pressure may be developed along the lines of the ideas embodied in the two new instruments.

Gasoline Analysis

The Gas Analysis Committee presented a very interesting paper on the "Use of Gas and Gasoline Analysis" in the practical operation of a gasoline plant. This paper, read by Walter J. Podbielniak, deals with the composition of natural gas. Methods of fundamental analysis of natural gas and gasoline were described. Attention was called to the necessity of accuracy in sampling the gas and gasoline for analysis. The application of the results of the analysis, showing the possibility of making use of gas analysis for plant survey and the results of several plant surveys was given.

Two surveys of gasoline stabilizers were presented showing conclusively the necessity of gasoline analysis for checking operation of the gasoline stabilizer. Some very interesting charts were shown giving the changes in composition of gasolines when weathered at constant pressure. It was agreed that fundamental analysis of natural gas and gasoline may be used for the accurate and absolute determination of potential production of products from a wet gas to determine plant and equipment efficiency, and to analyze plant performance. It is desirable when using fundamental analysis to make close material balances for the individual hydrocarbons entering and leaving equipment or plant in order to determine the dependability and accuracy of the test and to trace errors involved. Applications of fundamental analysis to plant and equipment surveys and to various calculations made possible by it were presented. The further application of both fundamental analysis and calculations of composition changes was advised.

Vertical Steam Stills

E. G. Ragatz' paper dealing with the graphical analysis of problems in the design and operation of vertical steam stills, as applied to absorption plants, was quite complete and gave examples of the calculations required. A number of curves were shown and their use described. A. V. Bourque, secretary of the Natural Gasoline Association of America, accompanied Doctor Brown to Los Angeles and personally conveyed the best wishes of his organization to the officers and members of the California association. This year's meeting was the largest and most successful ever held on the Pacific Coast.

President Ratcliffe's Address

In his opening address, Pres. George L. Ratcliffe said:

"During the year the subject of conservation has been uppermost in California. Gas conservation was one of the important problems. The association has taken an important part in the conservation activities by means of its committees and its statistical report.

"Possibly one of the greatest steps forward in the industry in California during the past year has been the universal adoption of methods of ultimate analysis to replace the former cut and try methods in use in the industry. The results of the use of these methods will be more apparent in the years to come, as by their intelligent use many of the industry's problems will be solved in a comparatively short space of time.

Conditions in California

"Conditions in the natural gasoline industry in California have not materially changed for the better or for the worse during the year. The industry is still confronted with overproduction of natural gasoline, resulting in lowering the value of our product. At the present time California is producing approximately 1,700,000 gallons of natural gasoline daily, and the anticipated production from the Buckbee sand at Santa Fe Springs will perhaps increase this production to more than 2,000,000 gallons daily. Stocks of natural gasoline have continued to pile up steadily during the past three years until we have some 56,000,000 gallons of natural gasoline in storage on the Pacific Coast. This quantity of natural gasoline is nothing to worry about, particularly as it constitutes only slightly over a two-months' supply at the current rate of utilization. The disconcerting fact is that in spite of the fact that the Engler distillation recovery of practically all of the natural gasoline manufactured in California has been substantially increased, with a resultant substantial decrease in production, the end of each month sees the stocks of natural gasoline gradually growing larger.

"The reasons for this continued overproduction are not difficult to ascertain. Overproduction of crude, increased effi-

(Continued on Page 141)

Big Attendance at Market Congress

Novel Features of Meeting Sponsored by Independent Oil Men of America Attract Jobbers From All Over Country

By J. B. Waldo

CHICAGO, Nov. 20.—A large attendance and keen interest in the business sessions has marked the first two days of the Oil Marketing Congress which opened here Monday under the sponsorship of the Independent Oil Men of America. The unique features of the congress, including a display of jobber equipment in private rooms rather than in one large display room, has been favorably commented upon by the several hundred jobbers and refiners in attendance.

Col. E. H. Hilpp, president of the association, presided at the opening session on Monday and delivered a short address in which he welcomed the several hundred oil men in attendance. He spoke highly of the work of Lou Harrington, executive manager, who has been in active charge of the association's work since March.

Mr. Harrington in the keynote address spoke on the hearty co-operation and assistance that he had had from the officers, members and the various people on the staff. He then took up the matter of relations within the association, its objects and accomplishments, and said that any organization must rely on the broad benefits to the industry and the individual benefits to the membership through this source rather than to the actual individual profits derived from the association membership. He told of the necessity of knowing your business, knowing the profits and the costs but spoke at length of the necessity for co-operation and co-ordination of efforts to make the individual business and the industry a success. In closing his address he reviewed conditions in the industry and said that some changes were bound to be made in the present systems of distribution. It rested with the oil men if they made the changes themselves or had them enforced by some regulative authority. At the close of this address he was very warmly applauded.

Dr. Hugh Baker, director, Trade Association Department, United States Chamber of Commerce, spoke on "Trade Associations and the Business Man." Doctor Baker has been for several years the manager of one of the older trade associations before accepting his present position and he drew some lessons from that connection. He stated that it had been found from a careful study of the activities of these older associations that the chief benefits came not from the tangible things done by these organizations such as the statistical departments, the sales promotion or the credit bureaus but from the better acquaintances, the better understandings and the greater co-operation that resulted. Speaking of price and production regulation he said that not only were these forbidden by law but that they were economically unsound and in most cases failed of their purpose no matter how cleverly devised. Regarding trade associations he stated that there were some things that the law forbid and that these things were understood by all business men but that there were a great many valuable things that any association could undertake within the law and with approval of the Government.

In speaking of trade abuses he mentioned some of the things that have crept into the ice cream industry and were to be corrected such as the buying of business. At the close of his address a member arose from the audience and stated that from what the speaker had just stated regarding the ice cream industry it was evidently a piker compared with the oil industry.

Direct Mail Advertising

Doctor Baker was followed by Omer Buckley, whose subject was "Direct Mail Advertising." After a brief introduction in which he related his experiences while connected with H. Gordon Selfridge at that time manager for Marshall Field & Co. retail store and now a leading merchant of London, he stated that in his conferences with department heads, Selfridge always directed particular attention to the keeping of customers. Mr. Buckley asked if any oil man present had an idea of the cash value of a customer and said that the great mail order houses had. They knew that to make a new customer cost them $10 and that the average customer was good for business amounting to $60 a year. He suggested that the oil men inspect their transfer ledgers and note how many good customers they had lost while trying to secure new ones and insisted that it was much easier and less expensive to hold the old trade than it was to get new accounts. Sixty-eight per cent of the customers that cease to trade with an average concern are lost through sheer neglect and only 9 per cent on account of prices. Fifteen per cent are lost through unadjusted grievances and he insisted that the customer who kicks is your friend while the one that simply stops buying and never gives the reason is the enemy of the business man who is trying to make a successful business. He illustrated his point by a number of pertinent and familiar instances. Mr. Buckley is not only a great believer in but a leading introducer of direct mail order advertising and necessarily his talk was very strongly favorable to this method which he claims has certain proven advantages for not only holding old but securing new business.

H. W. Blakesley, western manager of the Newspaper Advertising Bureau, followed with the story of "Newspaper Advertising." Like Mr. Buckley he is a strong believer in the power and efficiency of the printed word as displayed in the columns of live newspapers.

The Chicago Oil Men's Club which had taken over the entertainment of the guests had provided a theater party for the ladies, and for the gentlemen it gave

(Continued on Page 134)

Rocky Mountain Engineering Practice

Interesting Papers Presented at Meetings of Oil and Gas Association and A.P.I. Engineering Section in Casper, Wyo.

By Frank B. Taylor

CASPER, Wyo., Nov. 17.—The Rocky Mountain Oil & Gas Association met in the Masonic Temple at Casper with Former Governor B. B. Brooks in the chair and an attendance that practically filled the great hall. Meetings of the Rocky Mountain District, American Petroleum Institute, Division of Development and Production Engineering were held in conjunction with the meeting of the association.

All the prominent oil companies of the Rocky Mountain region sent representatives and several officials of oil firms in the Mid-Continent fields were on hand. W. F. Wilkerson, president of the Casper Chamber of Commerce, welcomed the association.

Governor Brooks deplored the lack of organization that had existed in the past and the lack of co-operation between the oil companies. Now, with the help of the American Petroleum Institute, the different oil and gas associations and similar organizations, a better day is dawning for the oil operator and he finds that his neighbor whom he formerly watched with jealous eye, is in reality a pretty good fellow.

A short business session was then held and on motion of Vice President R. S. Ellison of the Midwest Refning Co., a nomination committee was appointed by the chair. Another motion made by Mark Danforth of the Midwest Refining Co. delegated to the chair the appointing of a committee on resolutions.

Committee on nominations: F. E. Wood, M. C. Rathvon, H. Crocker, William Holland, Ralph Loucks.

Committee on resolutions: C. B. Richardson, R. E. Wertz, Hal Stewart, J. D. Leonard, Mark Danforth.

After the business session, Governor Brooks introduced F. E. Packard, tax commissioner of the Standard Oil Co. of Indiana, who spoke on the trend of the tax on gasoline sales.

The first afternoon session opened with the reading of a paper by A. Baker of the Ohio Oil Co. on the subject of unit operation as practiced in the Rocky Mountain region, where the oil fields are largely owned by the Federal Government and the State, with a comparatively few tracts of patented land, and the system of unit operation can be worked out most easily.

Engineering Meeting

Chairman F. E. Wood of the Midwest Refining Co. opened the session of the Rocky Mountain District American Petroleum Institute Division of Development and Production Engineering, and introduced John Steele, supervisor of the Rocky Mountain region for the United States Geological Survey, who presided.

C. E. Reistle was the first speaker, taking for his subject, "New Developments, Petroleum Engineering Methods." His paper dealt mainly with the gas lift versus air lift and the conclusion that at the critical pressure of 200 pounds and above, gas lift was proven to be the better while at pressure below 200 pounds, the air lift was the better method of bringing petroleum to the surface. Another phase of Mr. Reistle's paper dealt extensively with the storing of natural gas in dry sands for future use by the gas companies and he cited several cases where it had resulted advantageously. Mr. Reistle also showed where the intermittent injection of natural gas into an oil sand has a tendency to raise the gravity of the oil and at the same time increase the gasoline content of the gas.

W. G. Buckles of the Producers & Refiners Corp. read a paper on burning the different shales and sands for their identification. The color of the strata in the Rocky Mountain region can be altered under intense heats and this difference in coloring remains constant for each division of strata. This enables the geologist to identify his stratum without trouble where other means would fail.

W. H. Strang, deputy supervisor of the United States Geological Survey, spoke on "The Development of Cable Tool Coring Practice." Mr. Strang had been called away suddenly due to illness in his family and his paper was read by F. M. Cole of the Salt Creek office of the United States Geological Survey.

Mr. Strang's paper was followed by a comprehensive talk by H. H. Beagle on the shooting of wells.

The session was concluded with a paper titled, "Cable Versus Rotary Tools," by R. O. Armstrong, deputy supervisor, United States Geological Survey. Considerable discussion ensued as the audience seemed to be made up of both cable and rotary method adherents. The chair closed the discussion by adjournment.

Jamin Effect

The session of the engineering division, opened with the largest attendance yet seen at the meeting of the two oil societies. Chairman F. E. Wood asked R. S. Shannon to take charge as chairman of the production technique section. Mr. Shannon is field superintendent for the Continental Oil Co. in the Rocky Mountain region.

E. E. Klahr of the Continental Oil Co. was to have given a talk on "Good Pumping Practice," but owing to illness, was unable to prepare a paper. His place was taken by Dr. Frank E. E. Germann, professor of Physical Chemistry of the University of Colorado at Boulder, who took for his subject the Jamin Effect.

Experiments, he said, have proved that we obtain only about 30 per cent of the oil from the sands, the rest being held there through capillary attraction and other causes. The ideal method would be to have only one well at the crest of the dome and then have a hydrostatic pressure on the edge of the pool with salt water. Even in such cases, the water intrusion might channel and thus cut off large areas of oil-bearing

(Continued on Page 140)

Jim LeGoullon Was Friend to Many

Human Trouble Always Stirred Immediate Sympathy of Late Sinclair Pipe Line Co. Superintendent

By Thomas F. Smiley

So much extravagant praise is spoken of the dead that when a man like Jim LeGoullon passes on there is danger of the simple truth being misunderstood.

It is putting it with extreme conservatism to say that James Henry LeGoullon, division superintendent of the Sinclair Pipe Line Co., who died in his home in Tulsa November 10, was one of

James H. LeGoullon

the best loved oil men in the Mid-Continent Field. It was not because Jim—they all called him that—set out to be popular. It was because nothing else in this world engaged his immediate and unreserved attention, his sympathy and his prompt effort to help like human trouble.

Jim LeGoullon asked few questions as to how a man came to be in trouble, whether perhaps he might not have brought it on himself. If he was in it, that was enough to enlist Jim's aid. Nobody this side of eternity ever will know how many times Jim LeGoullon extended a helping hand or how many persons who had found life too hard and were on the point of giving up the struggle he encouraged to renew the fight and refuse to admit defeat.

Here is just one incident indicating the deep, honest affection in which Jim LeGoullon was held by the men who worked under him. Among those who attended the funeral in Tulsa was a six-foot, bronzed, broad-shouldered man in oil field outfit. Inquiry revealed that he was a line walker, whose daily inspection of a long stretch of pipe line was a hard, exacting task, requiring all the hours of a working day. The funeral service was at 2 o'clock in the afternoon. The man had risen long before daylight, completed his day's inspection and then come in from the Skiatook district just in time to pay his last tribute to the superintendent who had been not only his chief but his friend. There had not been time for him to change his clothing, so he came as he was. Another line walker at the funeral had got there the same way, rising early and doing his day's work before starting for Tulsa.

Attended to It Himself

When one of Jim LeGoullon's men was hurt or ill he didn't merely express his sympathy, delegate somebody to "see that he gets the best of care"—and then go on about his own duties. He himself saw to it that the victim of accident or disease was attended to properly. The case of Tom Knuckles might be cited as typical. Tom, a workman in the Nowata district, was handling a portable pumping outfit when one of his hands was caught and smashed. He was taken as promptly as possible to the nearest doctor, but he was in a serious condition from shock and loss of blood when Jim LeGoullon arrived. "He ought to be taken to a hospital," said the physician, "but he's in a bad way. I don't know how we could get him to a hospital and he's so weak I'm not sure he could stand the trip anyway."

Somebody had to make a decision and somebody had to act on it. Jim LeGoullon did both. The division superintendent put the injured man in his own car and with infinite care to avoid jolting drove the 100 or so miles to Tulsa, where Knuckles received skilled surgical attention and soon was on his way to recovery.

If occasion seemed to demand it, Jim could exercise the functions of a domestic relations court or of a social worker, with excellent results. If unhappiness in the homes of his men came to his attention and he believed he might help to remove it without intrusion or seeming officious, he quietly used his friendly persuasive powers. Such cases, in their very nature, received little publicity. Jim never talked about them, but he could not hide altogether his work as an adjudicator of domestic differences. He was known to have reunited husband and wife, to have brought about understanding and forbearance where there had been quibbling and obduracy, and to have adjusted all sorts of petty quarrels.

Jim Helped Them Out

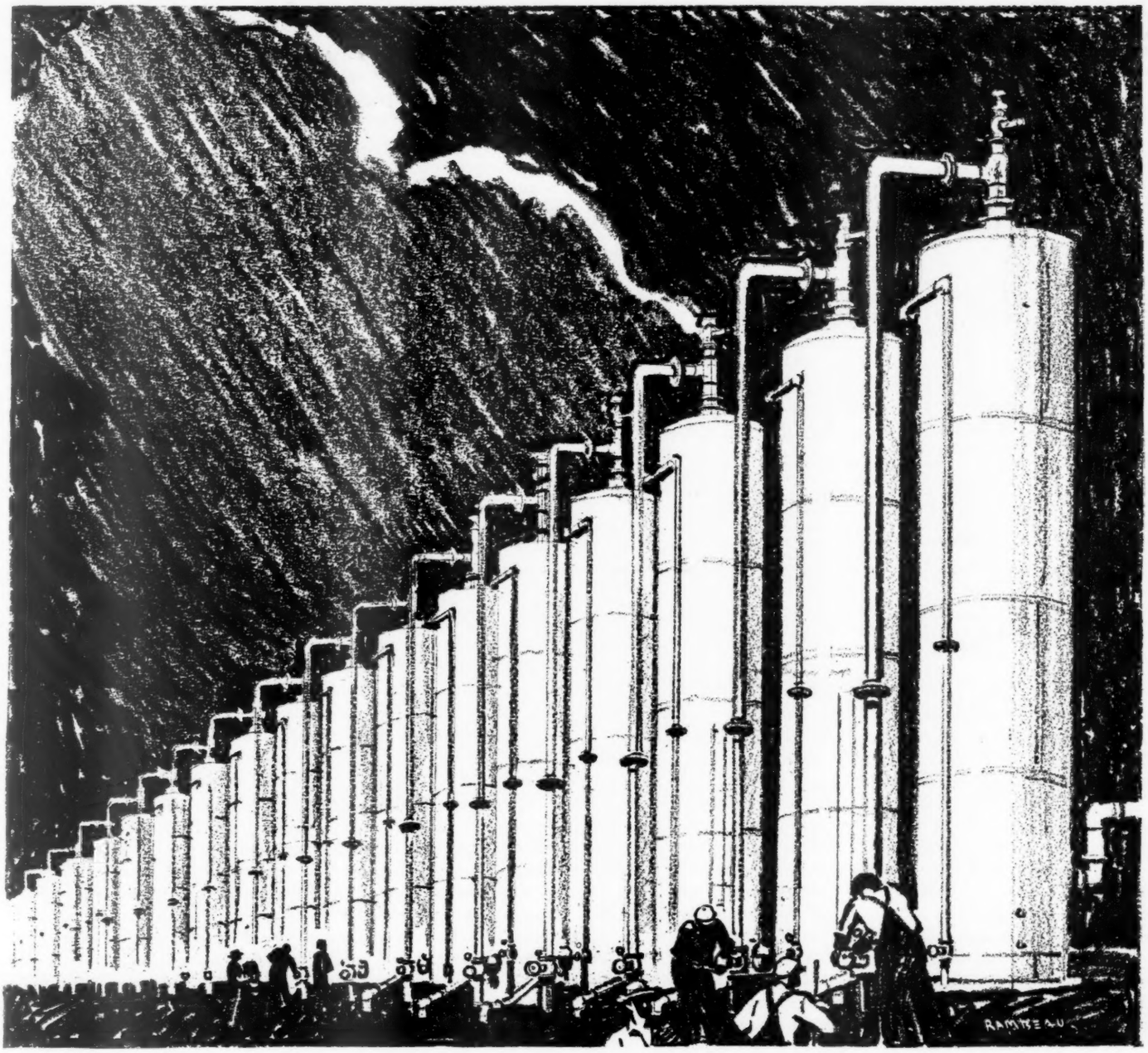
Whenever a man in hard luck asked for work Jim usually managed somehow to give him employment long enough to tide him over a critical period at least. And a man who felt old age creeping upon him had no reason to fear that he would be thrown out, for Jim made it his personal business to find some kind or work that a man failing in strength and vigor could perform. Always Jim was thinking of the welfare of a man's family as well as that of the man himself.

It is recalled how one workman was so careless and negligent that Jim, after repeated warnings had been ignored, directed the foreman to discharge him. Then Jim got to thinking about the man's wife and five children. What would they do? Jim called up the foreman by telephone. "Guess you'd better put that fellow back on and give him another chance," he said. The workman was reinstated, but the experience had a salutary effect and the quality of his work improved so that he was retained thereafter.

A motorist in trouble at the roadside might be passed by a stream of cars without receiving anything but a hurried look of mild curiosity from the occupants till Jim came along. Jim invariably stopped, no matter how pressed for time he himself might be, to see if he could be of any help. In most cases, with his mechanical ingenuity, he was able to get the stalled car started on its way again under its own power.

Once Jim came upon two women standing helplessly by their car near Skiatook.

(Continued on Page 140)



Over 780...

Southwestern Towers now in operation

....Exact fractionation
Efficient gas absorption
Economical distillation

SOUTHWESTERN ENGINEERING CORPORATION

606 SOUTH HILL STREET
LOS ANGELES, CALIF.
90 WEST STREET ~ NEW YORK CITY

BRANCH
605 Mayo Building
TULSA, OKLAHOMA

BRANCH
426 Transportation Building
MONTREAL, CANADA

The OIL and GAS JOURNAL
PRODUCING REFINING ENGINEERING MARKETING

Published Weekly by
THE PETROLEUM PUBLISHING COMPANY
114-116 West Second Street
TULSA, OKLA.

Established as an International Publication in 1910 by Patrick C. Boyle

President - - - - - - - - - - - - - Frank T. Lauinger
Vice President and General Manager - - Robert W. Egan
Secretary-Treasurer - - - - - - - - - - - W. T. Bryan
Editor - - - - - - - - - - - - - - - James McIntyre
News Editor - - - - - - - - - - - Andrew M. Rowley
Associate Editor - - - - - - - - - - - W. T. Anderson
Refinery Editor - - - - - - - - - - - - C. O. Willson
Technical Editor - - - - - - - Charles K. Francis, Ph.D.
Petroleum Engineering Editor - - - R. Van A. Mills, E.M.
Advertising Manager - - - - - - - - - Clarence Morris
Circulation Manager - - - - - - - - - - J. P Mulkern

DISTRICT ADVERTISING OFFICES
C. L. CAIN - - - - - 101 Park Ave., NEW YORK CITY
E. KLAPPENBACH, 1328 Peoples Gas Bldg., CHICAGO, ILL.
ALVIN E. LOEFFLER State Theater Bldg., PITTSBURGH, PA
C. R. JOHNSON - 831 Petroleum Securities Bldg., LOS ANGELES, CALIF.

TERMS OF SUBSCRIPTION
(By Mail, Postage Prepaid)

Single copies	$ .15	One year (in United States)	$6.00
Three months	$2.00	One year (in Canada)	$7.00
Six months	$3.00	One year (foreign countries)	$7.00

ADVERTISING RATES ON APPLICATION
Telephones: 6291-6292-6293
Remittances by Checks, Drafts, Express or Postal Money Orders should be made payable to
The Petroleum Publishing Company
Cable address, "Oilgasnal"

MEMBER AUDIT BUREAU OF CIRCULATIONS

FACILITIES AVAILABLE TO FIELD MEN

The fact that two district meetings of the American Petroleum Institute Division of Development and Production Engineering have been in progress during the past week concentrates attention upon the rapid development of that branch of A.P.I. activities.

Within a very brief period it has captured the attention of the production engineers who have taken an enthusiastic interest preparing papers for discussion and taking active part in the meetings.

But it may be well to emphasize that it never was the intention to make this division purely an engineering association. It is not for engineers alone but for production men generally, field men engaged in the actual drilling for and production of oil.

The misunderstanding probably arose from the fact that at the outset the engineers were naturally called upon to organize the districts, and to give the new organization its start. They have done this splendidly but now believe it should be made clear that the new division is designed to be of equal value to all production men, who should be given a direct invitation to attend the meetings.

In the oil producing industry there can be no hard and fast line drawn between the petroleum engineer and the production man charged with the drilling of wells and the production of oil. The field man, although he may never have studied engineering, has had to deal with engineering problems on his own initiative, seeking solutions as best he might through practical experience.

The result has been that, time and again, petroleum engineers have confessed their astonishment at the knowledge gained in this way by practical men reasoning from cause to effect or vice versa. They have been the more amazed to have field men state their conclusions in simple, nontechnical language where an engineer would have had to resort to scientific elaboration to make the same explanation.

As one leading petroleum engineer has said: "The boys in the field have as much to teach us as we have to give them and sometimes a little more—especially in directness of speech."

With that attitude the coming together of engineers and field men in these district meetings of the A.P.I. Division of Development and Production Engineering should prove of immense benefit to both and to the industry at large.

In the district meetings already held in various sections of the oil country the discussion by field men present has often thrown new light on the problems treated of in the papers presented. These men, accustomed to deal with conditions rather than textbooks, found the engineers could often make plain what otherwise was puzzling while the engineers had their conclusions modified or advanced by the constructive criticism of the men in the field.

This experience has made the engineers more anxious to have the active co-operation of the field men in the new division for mutual benefit. When the field men realize that the new division is not merely for engineers but for production men and that the engineers really wish their co-operation in carrying on the division's program the real work of the Institute's newest organization will have been properly started.

As organized the Institute's Division of Development and Production Engineering is divided into five districts, one for each of the chief oil producton sections; the Eastern fields, the Mid-Continent, Texas, Louisiana and Arkansas, the Rocky Mountain area, and the Pacific Coast.

In this way the men of each field will meet to consider and discuss the problems peculiar to their own region or the application of methods and practices in general use as modified by conditions in their section.

The programs for these district meetings have been framed to offer papers on each phase taken up by men who have been specially qualified by experience and study to deal with each subject. Many of these papers are illustrated by lantern slides or otherwise visualized, making them clearer to the nontechnical.

In a big way the division is developing into a big school for the oil producing industry where engineers and field men may get together on their problems and thresh them out with mutual advice.

The new division offers the ambitious field man the opportunity to familiarize himself with the newest thought and freshest experience in dealing with matters which engage his attention from day to day. He can come in, as the engineers themselves do, as a student, on an equal footing and with a like motive of learning.

He can contribute from his experience just as the engineer can supplement that experience with scientific knowledge. One is the complement of the other, both being necessary to the most thorough study of each problem and the finding of a solution.

The new division of the Institute is part of the industry. The Institute is supported by the oil companies of the country for the general good of the industry. Its most useful development depends upon the extent to which the whole industry takes part in its work. If it were only an annual meeting of executives for the consideration of policies it would fall far short of what it ought to be.

That was realized some years ago when the Institute decided to take up special work like standardization, public relations, uniform accounting, research, and now development and production engineering.

In this way the Institute takes a proper leadership in actual development within the industry but this leadership must have the active co-operation of the men in the industry to get results.

Particularly is this true in regard to this new division which was started with a definite purpose of helping engineers and field men to help themselves. The companies maintaining the Institute should see that field superintendents, farm bosses and field men generally are given opportunity to attend these meetings.

The division is now functioning in all five districts, the fall meetings having just been held in the Mid-Continent and Rocky Mountan fields. The California and Texas, Louisiana and Arkansas districts held their meetings a few months ago. The Eastern district meets Saturday. All these meetings would have been of vastly more benefit to the industry and to the men in it had the field men been as thoroughly interested as the engineers have been.

Between now and the next meetings this can be accomplished. All that is necessary is to assure the field men opportunity to join the division and profit from its activities. There are no men in any industry more sincerely desirous of learning and keeping abreast of every new development.

Along the trail of the lonesome pines
DRESSER
COUPLINGS
DOMINATE
S.R. Dresser Mfg. Co.
Bradford, Penna.

WESTERN REFINERS ENTERTAIN FLAMMABLE COMMITTEE OF N.F.P.A.

Mid-Continent refiners and natural gasoline manufacturers have arranged several trips for members of the Flammable Committee of the National Fire Protection Association who are meeting in Tulsa November 21, 22 and 23, including one through the Marland Refining Company's plant at Ponca City on Wednesday and the gasoline plant of the Phillips Petroleum Co. at Burbank, Okla., on Thursday. In addition, the Western Petroleum Refiners Association gave a dinner for the members Wednesday night and C. T. Ingalls, manager of the Oklahoma Inspection Bureau, also a member of the association, has arranged a lunch and an inspection of the 101 Ranch at Ponca City while there.

The parent organization, the National Fire Protection Association, is composed of approximately 600 members, representing all industries and agencies interested in the protection of life and property. The committee which is meeting in Tulsa is of particular importance to the oil industry since its work includes the handling of all flammable liquids and oil exceeds any others in both quantity and value. This committee is made up principally of engineers and technical men from the industries but also includes representatives of insurance companies. The committee acts in an advisory capacity to the fire underwriters and to civil bodies in the drafting of protective codes and ordinances. The influense of this work is national in scope and one of the problems about to be completed and of great interest to the oil industry is that of standardizing tank wagon trucks.

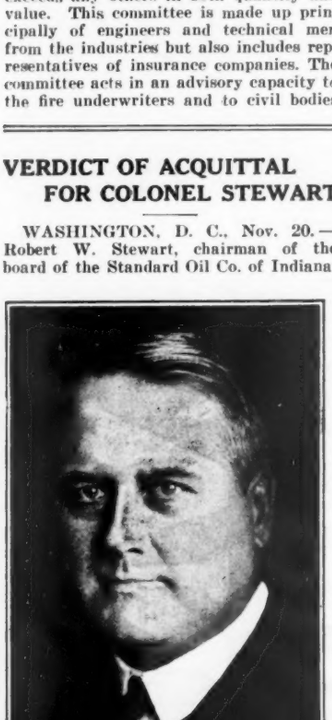
Through this, the committee has attempted to specify how deliveries may be made to provide maximum safety against fire but at the same time reasonable flexibility in the code so as not to penalize the industry. Another problem to be investigated in the immediate future is that of loading and unloading tankers at docks.

This problem will probably take up a large share of the time of investigation during the next year and much consideration has been given the problem during the meetings in Tulsa.

At the dinner Wednesday evening, P. M. Miskell, general manager of refineries of the Empire Oil & Refining Co. and chairman of the Mid-Continent section of the A.P.I. on fire prevention, extended the committee a welcome and in a few words explained the vastness of the oil industry as it functions today. He followed by calling attention to the fact that both the public and the refiners will benefit through a co-operative effort to impartially analyze all factors promoting for safety in the oil business through the National Fire Protection Association.

VERDICT OF ACQUITTAL FOR COLONEL STEWART

WASHINGTON, D. C., Nov. 20.—Robert W. Stewart, chairman of the board of the Standard Oil Co. of Indiana,



R. W. Stewart

was acquitted by a jury in District of Columbia Supreme Court today.

The jury brought in this verdict after only 55 minutes' deliberation freeing Colonel Stewart on each of three counts of the indictment.

On the motion of defense counsel Colonel Stewart was immediately discharged from custody and his bond was returned.

WELL AT BOGGY CREEK HAS TOPPED PAY SAND

By Neil Williams

CORSICANA, Tex., Nov. 17.—At Boggy Creek, on the Anderson and Cherokee County line, Humble Oil & Refining Co.'s No. 2 Holloway on the southeast side has topped the pay sand at 3,798 feet and will cement casing to test.

This company's No. 2 Lizzie Smith, Boggy Creek, is drilling sticky shale at 3,060 feet. No. 1 Todd is in hard black shale at 3,601 feet, and a rig is up for No. 1 W. T. Todd. On the northwest flank No. 1 Guaranty is drilling sticky shale at 4,251 feet, and on the northeast side No. 3 Weinbery is in hard lime at 3,389 feet.

Humble, which has taken over the test in the Neches River by E. L. Smith, abandoned at 3,561 feet, is reaming at 3,558 feet and will deepen. This test is midway on the east between the productive pools on the north and south sides.

Daily average production of East Central Texas fields for the week was:

EAST CENTRAL TEXAS

	Bbls.
Boggy Creek	1,811
Cedar Creek	245
Currie	502
Mexia	6,489
Minerva	750
Nigger Creek	470
Powell	9,855
Richland	460
Thrall	35
Wortham	1,580
Total this week	22,197
Total last week	22,418
Decrease	221

MAY REPEAL RESTRICTIONS

Reports from Bucharest state Minister of Industry Madzearu says the Rumanian government intends to repeal restrictions on development of Rumanian oil industry.

MAINTAINS NEW YORK OFFICE

Although the plant and general offices of De La Vergne Machine Co. have moved from New York to Philadelphia, the firm still maintains a large staff at its New York branch office, 100 Broadway, New York City.

SHELL P. L. STATEMENT

The Shell Pipe Line Corp.'s crude oil runs from Texas, Oklahoma and Kansas fields in October were 3,860,949.51 bbls., a daily average of 124,547 bbls., and its deliveries were 3,784,424.64 bbls., a daily average of 122,078 bbls., a difference of runs over shipments of 76,524.87 bbls. for the month, or 2,469 bbls. per day.

JUDGE SHEA DIES

John J. Shea, prominent lawyer and oil producer of Tulsa, and a former district judge in Oklahoma, died in Tulsa on Wednesday, November 14, of paralysis. Judge Shea had been in ill health for some time.

HIGH SPOTS IN FIELD NEWS

OKLAHOMA

Greater Seminole dropped to new low Tuesday morning, figures being 290,516 bbls.

In East Little River Pool two water wells close to Mid-Continent Petroleum Corp.'s discovery well tended to cut down area of possible production.

In Maud region hopes of the Hunton and Misener sand territory on the west side of Township 8-5 declined when the Prairie No. 1 Campbell drilled the Misener sand at 4,198-99 feet, swabbed 150 bbls. of oil and showed three bailers of water per hour.

Failure of No. 2 Guinn eliminates possibility of eastern extension of the St. Louis Pool.

NORTH LOUISIANA-ARKANSAS

Gulf Refining Co. has best well in ten years in Shelby County, Arkansas, 144 bbls. of 34 gravity with 5,000,000 feet of gas. May be long-sought Shelby County Pool.

Magnolia Producing Co. well in Caddo Parish is bailing 50 bbls. an hour of 35 gravity. Territory hitherto thought barren.

GULF COAST

Two more 1,000-bbl. wells were completed Monday in South Liberty new shallow sand area but on Tuesday the discovery well stopped flowing and a south offset failed to flow. The two 1,000-bbl. wells were Sun Oil Co.'s Nos. 12 and 13 Mitchell.

At Pierce Junction Shaw and associates' No. 2-C Fitzsimmons came in flowing 800 to 1,000 bbls.

MUSKEGON

Court refuses injunction asked by State against drilling violation. Legislature expected to pass new laws.

CALIFORNIA

Fourth California gasser blows in at Potrero. Bellview well still wild. Milham Exploration discovery in Kettleman Hills is making 4,000 bbls. of 60 gravity oil and on completion of gasoline plant will produce 100,000 gallons of natural gasoline daily.

Some 24,500 bbls. of new production added at Santa Fe Springs, 4,850 bbls. at Elwood and 7,569 at Long Beach. Bolsa Chica Co. completion in Ventura Avenue Field flows 5,008 bbls.

Expected that Santa Fe Springs will be up to 150,000 bbls. by end of the year.

WEST TEXAS

New pool indicated in eastern Howard County.

Ward County discovery well improving.

North Texas

Wildcat in Young County spraying 15 bbls. hourly with 5,000,000 feet of gas from 4,274-83 feet.

Late News from the Field

OKLAHOMA

The Greater Seminole area again slipped to a new low on the 24 hours ending Tuesday morning, November 20, when the production by pools was as follows:

	Bbls.
Little River	104,502
Maud	5,274
Mission	1,765
Bowlegs	50,411
Earlsboro	76,251
Seminole	41,811
Searight	10,502
Total	290,516

The most interesting field developments came from the East Little River Pool where two water wells rather close to the Mid-Continent Petroleum Corp.'s No. 1 Smith, the discovery well, tended to further cut down the area of possible production. The first water well was the Gypsy Oil Co.'s No. 1 Payne, NW cor. NE NE, Section 5-7-7, one-quarter mile east of the Smith well. The Gypsy well had the Wilcox sand 4,424-28 feet, and is drilling at that depth with a hole full of water. The second failure is the Shell Petroleum Corp.'s No. 1 Jeffries, NE cor. SE SW, Section 32-8-7, one-quarter mile straight north of the Smith well. The Shell well had the Wilcox sand 4,475-83 feet, and is filling with water. At last reports it had 1,000 feet of water in the hole.

In the Maud region, the hopes of the Hunton and Misener sand territory on the west side of Township 8-5 received a blow when the Prairie Oil and Gas Co.'s No. 1 Campbell, SE cor. SW, Section 18-8-5, drilled the Misener sand 4,198-99 feet, and is swabbing 150 bbls. of oil and showing three-quarters of a bailer of water per hour. This well is one-quarter mile to the west of the Pure Oil Co. well which opened the Misener sand activity in this region.

On the east side of the St. Louis Pool, the Mid-Continent Petroleum Corp.'s No. 2 Guinn, SE cor. NE, Section 20-7-5, is a failure in the Wilcox sand, found 4,372-89 feet. This well is one-quarter mile to the east of the Mid-Continent Petroleum Corp.'s No. 1 Guinn in Section 20-7-5, and the failure of No. 2 Guinn further eliminates any possibility of an east extension.

NORTH LOUISIANA-ARKANSAS

SHREVEPORT, La., Nov. 20.—Two unusual wells completed over the week end and turned into the tanks have put considerable pep into the fraternity. Gulf

(Continued on Page 142)

Wildcat Producer in Young County

Panhandle Refining Co.'s Well Sprays 15 Bbls. Hourly With 5,000,000 Feet of Gas From New Deep Sand

By James H. Dameron
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Nov. 19.—Probably the most significant development in North Texas during the past seven days was the strike made by Panhandle Refining Co. Production of the area increased 789 bbls. in daily average production in comparison to the previous week when each of the three districts registered gains.

In wildcat territory of Young County, northwest of Graham approximately 4 miles, Panhandle company's No. 1 Morrison, Section 456, T.E.L. Survey, is spraying 15 bbls. hourly with 5,000,000 feet of gas from 4,274-83 feet. Some geologists correlate the pay zone as possibly the Ranger sand, while in most reports the producing formation is described as gray lime.

It is reported the well was deepened without any increase in oil or gas, but has some cavings in the hole and is being cleaned out. The strike is expected to lead to considerable more deep exploration in this section of Young County and possibly a high-gravity pool of marked importance may be developed.

In the other areas of the Wichita Falls district there were few developments of note. Production increased slightly to carry the district's daily average within 125 bbls. of the 100,000-bbl. mark. The gains were scattered through several counties.

Wilbarger County fell sharply in flush production when only one well was completed. That producer, however, was good for 800 bbls. and was completed in the Greyback Pool.

Young County Most Active

Young County forged ahead and is the most active county in the district with regard to development. A flock of spudder tests were completed as dusters with only a few shallow producers being made. Approximately 20 new locations were made in that county to close up the gaps in the drilling reports left by the dry holes.

Fain-McGaha Oil Corp.'s No. 3 Matthews, near the center of the east line, Section 3, G.C.&S.F. Survey, Abstract No. 117, Foard County, is one of the most interesting tests. Some time ago those operators encountered a fair show in No. 1 Matthews. No. 3 Matthews missed the 1,505-foot sand found in No. 1 and was drilled deeper and found 500,000 feet of dry gas at 1,602-10 feet. Eight-inch casing is being underreamed in shale at 1,670 feet.

Collett and associates' No. 1 Newell, SW cor. E half SE Section 114, G.& H.H. Survey, in Shackelford County, was one of the more important tests in the Ranger district. The well made 2,000,000 feet of gas from 1,354 feet and many geologists call this pay the Tannehill zone. The well is regarded as having a good chance of opening another Cook sand pool.

Midsun and associates' No. 1 Overall, J. H. Barclay Survey No. 700, Coleman County, continues to be the most remarkable well in that county. It was drilled in making around 700 bbls., and for the period October 8 to November 14 has averaged 630 bbls. daily. It is now producing around 665 bbls. The gravity has shown a good increase. Initially it was 41 gravity and has since increased to 43.5.

Another production deal was one of the most interesting developments of the Ranger district. Kone Production Co. sold its A. B and C Hickman leases in Brown County to Ben Mex Petroleum Co. for a reported consideration of $350,000 cash and $50,000 in oil. Ben Mex Co. is headed by J. L. Norton of New York City. The three leases totaled 219.2 acres. There are 29 wells on the property and they averaged 674 bbls. daily during October. About a month ago Ben Mex Co. purchased the Swensondale's holdings in Stephens, Runnels, Fisher, Jones, Shackelford, Haskell and Throckmorton Counties.

Coleman County Line

Atlantic Pipe Line Co. has completed 2½ miles of 6-inch pipe from its main 10-inch trunk from West Texas to the Coast, to top the light oil belt in Coleman County. Connection has been made with Midsun and associates' No. 1 Overall, and Atlantic company is soliciting other connections in Coleman. It is reported the Atlantic Co. plans the construction of a natural gasoline plant in Valeria, which is near Coleman County production.

Air Lift in Panhandle

Skelly Oil Co.'s No. 3 Armstrong and Byrd in the Armstrong Pool of Moore County furnished most of the interest from the Panhandle. The well was put on gas lift last week and registered a surprising increase in production. Its best 24-hour gauge was 3,037 bbls. The gauges for seven days are as follows.

November 7, 10 hours, 1,224 bbls.; November 8, 15 hours, 1,876 bbls., and the following full 24-hour gauges: November 9, 3,037 bbls.; November 10, 2,929 bbls.; November 11, 2,833 bbls.; November 12, 2,810 bbls., and November 13, 2,732 bbls. Production of this well was the factor giving Panhandle a 555-bbl. increase in daily average. More about the Armstrong Pool will be learned in a few days with the completion of some of the several tests now drilling.

The Lefors area is proving more disappointing and the encroachment of water in that newest of Gray County pools is becoming alarming. It was estimated the latter part of last week that practically all of the wells of any appreciable age are making water and the average water percentage per well is around 10 per cent.

Consolidated Gas & Utilities Co. has completed its 16-inch gas transmission line originating in the Shamrock area of Wheeler County and terminating at Enid, Okla. Late last week approximately 12,000,000 feet of gas daily has been transported through the line. Completion of this line marks the starting of operation of the Panhandle's sixth main line from the gas fields. Those lines are supplying gas to towns in six states.

NORTH TEXAS

Estimated Daily Average Production for the Week Ending November 17

Panhandle District—	
Carson County	5,950
Gray County	26,200
Hutchinson County	30,035
Moore County	2,640
Potter County	15
Wheeler County	815
Total this week	65,655
Total last week	65,100
Increase	555
Wichita Falls District—	
Archer County	19,427
Baylor County	87
Clay County	519
Cooke County	2,280
Jack County	1,303
Montague County	7,883
Throckmorton County	798
Wilbarger County	32,581
Young County	8,638
Wichita County	26,360
Total this week	99,876
Total last week	99,751
Increase	125
Ranger District—	
Brown County	10,353
Callahan County	3,688
Coleman County	3,934
Comanche County	1,265
Palo Pinto County	355
Ranger	5,886
Shackelford County	10,471
Stephens County	7,664
Total this week	43,616
Total last week	43,507
Increase	109
Grand total this week	209,147
Grand total last week	208,358
Increase	789

PANHANDLE COMPLETIONS

Week Ending November 17

Hutchinson County

Barnum Oil Co.'s No. 1 Johnson Brothers (Delmar), NW cor. E half NW Section 37, Block Y, A.&B. Survey, was drilled to a total depth of 3,020 feet, shot with 160 quarts at 2,954-3,006 feet and swabbed 150 bbls. Phillips Petroleum Corp.'s No. 1 Sanford Felix, 330 feet south and east of NW cor. of south 40 acres of east 80 acres of south 160 acres of Section 77, Block 46, H.&T.C. R.R. Survey, was drilled to a total depth of 2,941 feet, shot with 50 quarts at 2,928-36 feet and had an initial production of 100 bbls. the first 17 hours. Prairie Oil & Gas Co.'s No. 61 Johnson Brothers-A was drilled to a total depth of 2,843 feet and had an initial production of 75 bbls. after having been shot with 80 quarts at 2,808-40 feet.

Gray County

Magnolia Petroleum Co.'s No. 3 fee, 600 feet from south line and 330 feet from east line of Section 11, Block 3, I.&G.N.R.R. Survey, was drilled to a total depth of 2,910 feet, flowed 22 bbls. from a granite wash encountered at 2,898-2,910 feet and made 3,000,000 feet of gas at 2,700 feet. Wilcox Pampa Oil Co.'s No. 29 Worley-Reynolds, 330 feet south and west of NE SW Section 61, Block 3, I.&G.N.R.R. Survey, swabbed 300 bbls. from the granite wash encountered at 3,052-3,130 feet. The Texas Company's No. 1 McLarty-A swabbed and flowed 681 bbls. from a granite wash found at 2,405-2,648 feet and 2,383-2,400 feet. The Texas Company's No. 3-C Thut, 370 feet from south and 349 feet from east lines, Section 11, H.&G.N. Survey, flowed 250 bbls. at 2,732-35 feet and 2,745-56 feet.

Moore County

Prairie Oil & Gas Co.'s No. 3 O. E. Gober, 2,302 feet from north and 890 feet from west lines of Section 16, Block M-1, G.&M. Survey, was drilled to a total depth of 3,745 feet, encountered salt water at 3,705 feet, plugged back to 3,505 feet and made 13,000,000 feet of gas at 2,745-3,366 feet.

King County

Humble Oil & Refining Co.'s No. 1 Pitchfork, Section 171, Block A-96, John H. Gibson Survey, was dry and abandoned at 4,752 feet.

WICHITA DISTRICT COMPLETIONS

Archer County

Conoco and others' No. 1 Parrish was dry and abandoned at 1,605 feet. McCutchen's No. 9 Perkins was dry and abandoned at 1,192 feet. Consolidated Oil Co.'s No. 4 Neimeyer was dry and abandoned at 1,442 feet. C. W. Gilliland's No. 8 Neimeyer made 100 bbls. at 1,420-30 feet. L. V. Hull's No. 1-A Andrews was dry and abandoned at 1,051 feet. R. Q. Jones and others' No. 1 Andrews was dry and abandoned at 900 feet.

A. Minnick's No. 1 Wilson was dry and abandoned at 1,322 feet. William Moore's No. 1 Ward was dry and abandoned at 1,250 feet. Mount and Simms Petroleum Co.'s No. 1 Abercrombie & Taylor was dry and abandoned at 1,372 feet. Panhandle Refining Co.'s No. 8 Prideaux was dry and abandoned at 656 feet. F. P. Rose's No. 1 Parkey was dry and abandoned at 1,602 feet.

The Texas Company's No. 9 Hayter made 4 bbls. at 1,416-26 feet. G. Braggett's No. 1 Kinder was dry and abandoned at 1,320 feet. Frank Hutchinson's No. 4 fee made 65 bbls. at 1,151-55 feet. Moss Farm Oil Co.'s No. 2 Moss was temporarily abandoned at 963 feet. Turner and others' No. 1 Lyles made 90 bbls. at 1,690-96 feet. American Refining Properties and others' No. 2 Cernosek made 31 bbls. at 1,433-43½ feet.

Golding-Cochran & Cline's No. 23 Prideaux made 10 bbls. at 646-51 feet. Madden & Hunt's No. 9 Richardson made 60 bbls. at 1,290-1,306 feet. Panhandle and Grisham's No. 5 Farmer was dry and abandoned at 1,545½ feet. Prairie Oil & Gas Co.'s No. 1 Knight was dry and abandoned at 1,350 feet. The Texas Company's No. 22 Richardson made 30 bbls. at 1,346-63½ feet.

Montague County

Benton-Woods and others' No. 11 Hines made 15,000,000 feet of gas at 672-757 feet. Conoco Oil Co.'s No. 3 Jones made 23 bbls. at 773-82½ feet. Pure Oil Co.'s No. 10 Loy and others made 16 bbls. at 805-18 feet.

Cooke County

Thornton and others' No. 1 Poteet had an initial production of 50 bbls. at 1,262-71 feet. Heydrick-Camp Drilling Co.'s

(Continued on Page 142)

TEXAS PANHANDLE WILDCATS

Week Ended November 17

Company, Well, Farm, Name, Section and Block—	Remarks—
CARSON COUNTY	
Denson et als' No. 1 W. E. Cobb, 930 ft. from N line, 280 ft. from E line, W ½ NW, Sec. 184, Blk. 2, I.&G.N. Sur.	S.D. 725 ft.
Duncan & Reiger's No. 1 J. B. Hodges, 330 ft. from E line and 330 ft. from S line of W½ of NW¼ Sec. 112, Blk. 7, I.&G.N. Sur.	Rig on ground.
Magnolia Pet. Co.'s No. 6 fee No. 244, 660 ft. from N line and 660 ft. from E line of E ½, Sec. 91, Blk. I.&G.N.R.R. Sur.	Drlg. 495 ft.
Morris et als' No. 1 Barnard, NW cor. SW SE, Sec. 44.	Drlg. 410 ft.
Navajo Oil Co.'s No. 2 Poling, 660 ft. from W and 330 ft. from N lines, N 30 acres SW, Sec. 22, Blk. X-2, T.T.R.R. Sur.	S.D. 1,950 ft.
Reynolds et als' No. 1 E Cooper, 330 ft. from S line and 330 ft. from E line of NW, Sec. 5, Blk. 9, I.&G.N. R.R. Sur.	S.D. 260 ft.
Spartan Oil Co.'s No. 1 S. Bednorz, NW cor. E ½ NW, Sec. 202, Blk. 3, I.&G.N. Sur.	Drlg. 980 ft.
Skelly Oil Co.'s No. 10 Schafer, 1,320 ft. from W line and 330 ft. from S line of N½ Sec. 188, Blk. 3, I.&G.N.R.R. Sur.	Rig.
Stubblefield et als' No. 1 Cooper, 340 ft. N and 330 ft. W line SE, Sec. 5, Blk. 9	Drlg. 1,060. ft.
Travis et als' No. 1 D. A. Harrell, C NE NE, Sec. 162, Blk. 7, I.&N.G. Sur.	Fish. 2,410 ft.
Ware et als' No. 1 Ware, 990 ft. S and 400 ft. E of NW cor. Sec. 18, Blk. 3, A.B.&M.	Spud and S.D.
CASTRO COUNTY	
Colorado O. & R. Co.'s No. 1 M. Slemmons, SW cor. Sec. 72, Blk. M-17, B.S.&F. Sur.	Rig blown down.
Mystery Oil Co.'s No. 1 J. L. Crum, SE cor. NE, Sec. 333, Blk. M-6, S.K.&K. Sur.	S.D. 510 ft. for csg.

(Continued on Page 96-D)

New Pool in Eastern Howard County

Ward County's Wildcat Producer Apparently Improving. West Texas Daily Average Production Up 7,580 Bbls.

By James H. Dameron
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Nov. 19.—Although a new pool in eastern Howard County is indicated most of the interest in West Texas last week centered around the developments in Winkler County. Ward County's wildcat producer apparently is improving and West Texas production soared upward 7,580 bbls. to form the gist of news from the Permian Basin of Texas.

L. C. Harrison and associates' No. 1 G. M. Dodge, SE cor. Section 9, Block 30, T-1-S, T.&P. Survey, apparently is the forerunner of a new pool 15 miles east and a little south of Big Spring. Monday the well encountered 2 bailers of sulphur water per hour at 3,028-38 feet. However, it showed for a well estimated good for 100 to 200 bbls. daily when shot in the pay zones higher up.

The best pay was encountered at 2,870-85 feet and has had showings all the way down from 2,660 feet. At 2,895 to 2,903 feet the well had a small increase, another at 2,937-52 feet and still another at 2,970-73 feet. It is reported the test will be plugged back and the showings shot. Conservative estimates give the well a potential production of 100 bbls. Before encountering the water it had 400 feet of oil in the hole.

O'Brien Pool

Most of the interest in Winkler County was in the O'Brien Pool, a few miles south of the Hendricks Pool where Richardson and associates got a good producer in Section 50, Block F. Barnsdall Oil Corp.'s No. 1 Tobe Morton, SW cor. Section 26, Block B-12, northeast offset to the pool opener, has completely upset ideas about that pool. It cored salt from 2,660 to 2,801 feet and Monday was drilling in anhydrite at 2,850 feet.

The Richardson producer has a surface elevation of 2,729 feet and topped lime at 2,648 feet. Barnsdall company's No. 1 Morton has a surface elevation of 2,730 feet and has not yet topped the lime. This is a rotary drilled test and some believe the hole is crooked.

However, some geologists are of the opinion that the structural high lies more to the southwest than was formerly believed. Some geologists think there is some kind of a faulted condition around the Richardson well and support their views by pointing out similar situations in the Hendricks Pool.

One of the two Gulf Production Co. wells have to reach the lime or the depth where it was found in the Richardson and others' producer before much can be learned of the structural conditions. Gulf company's east offset to the Richardson and others' well cemented a cavity at 1,841 feet, and No. 3 O'Brien, south of this well, is drilling at 1,010 feet.

Barnsdall corporation has shut down No. 2 Morton at 1,094 feet and Marland Oil Co. shut down No. 1 Morton, Section 27, at 417 feet awaiting the outcome of other wells. Wentz Oil Corp. is going ahead with its No. 1 in Section 27, and Simms Oil Co. and others are preparing to drill No. 1 Stockton, Section 50, Block F.

Cranfill and Reynolds' No. 1 Hendricks H, Section 16, Block 26, 2 miles north of production, apparently has defined the limits of the Hendricks Pool that far north. It is running low and will probably be abandoned at 2,900 feet. Surface elevation of this test is 2,874 feet and at total depth it was in red rock and anhydrite.

Potential Declines

Potential production of Hendricks declined 28,627 bbls., according to the new proration gauges made for the middle of November. The potential production is 2,743,221 bbls. from 430 wells. Nine new units went into production, bringing the total units to 188. There were 121 wells tested but despite the completion of some big wells during the first half of November the potential production declined. Some of this is because only 121 wells of the 430 were gauged. Those not gauged had a small percentage subtracted from their former potential gauge. Southern Crude Co. has the highest potential production with 353,984 bbls. and Gulf Production Co. is second with 351,257 bbls.

Following is a table giving the potential production by companies:

WINKLER COUNTY ALLOWABLE PRODUCTION BY COMPANIES
Effective November 16 to 30, 1928

Company—	Wells	Units	Potential Production	Allow'ble Quota
Atlantic O. P. Co.	28	13	140,697	9,033
Atlantic-Kesslar & Logan	1	1	6,833	586
Atlantic and Collett	13	4	192,519	6,859
Bankers Prod. Corp.	1	1/6	5,112	190
California Company	8	2	21,802	1,394
Cranfill & Reynolds	8	2½	43,270	2,179
Eastland Oil Company	2	1	1,428	438
Empire G. & F. Co.	1	1	1,710	446
Gulf Prod. Co.	27	21	351,257	14,391
Humble Oil & Refining Co.	32	14	125,516	9,017
Independent O. & G. Co.	17	8½	59,658	5,023
Magnolia Pet. Co.	8	2	1,714	845
Marland Pet. Co.	6	3	26,340	1,916
Murchison & Cranfill	7	2¼	22,598	1,516
Murchison & T. P. Lee	1	½	13,156	559
Republic Prod. Co.	12	5½	78,848	4,228
Roxana and Texas	41	16	341,998	15,733
Roxana Pet. Corporation	35	15	279,725	13,633
Prairie O. & G. Co.	6	3	87,294	3,584
Pure Oil Company	30	12	294,637	12,843
Skelly Oil Company	12	4	267,078	8,898
Southern Crude O. P.	99	57½	353,984	32,516
Texon Oil & Land Co.	10	4	20,934	2,169

Yates showed a potential production of 4,166,917 bbls. from 275 wells. Thirty-seven wells are showing water but most of these are edge wells. Mid-Kansas Oil & Gas Co. and Transcontinental Oil Co. had the highest potential production of any producer in Yates with 1,969,035 bbls.

North Hendricks Completions

Three wells completed by Southern Crude Co. in the north part of the Hendricks Pool have started making oil. No. 3 T-88 N, SE cor. Section 28, Block 26, was completed as a 50,000,000-foot gas well and is now making 1,480 bbls. daily with 250 pounds back pressure.

No. 1-T-88-R, SW cor. Section 27, also a 50,000,000-foot gas well, was opened November 13 and started flowing at the rate of 600 bbls. hourly. It is producing from 2,590 to 2,640 feet and has been pinched to 41 bbls. per hour with 450 pounds back pressure. No. 2-88-R, another gas well, was opened and is making 25 bbls. hourly with 450 pounds back pressure on it. All these wells were high structurally.

Shell Petroleum Corp. (Roxana) and The Texas Company's No. 10 Hendricks-A, SW cor. Section 29, Block B-5, was the big well of the week in Hendricks. It was rated a 21,312-bbl. producer from 3,013-19 feet, on a proration test and was pinched to 870 bbls. daily with 350 pounds back pressure.

Howard County

The potential production of the lime producers in the Roberts Pool in Howard and Glasscock Counties is 47,959 bbls. from 36 wells. The potential of the 28 deep lime wells is 39,188 bbls. and the potential of the 2,500-foot producers is 3,579 bbls. Henshaw Corp.'s well in Section 6, Block 32, was not included in the umpire's report and this well would send the potential of the pool to above 50,000 bbls.

Taylor Link Oil Co.'s No. 1 Kloh-Rumsey, Section 3, Block 32, T-2-S, pumped a little more than 900 bbls. on a full 24-hour gauge and made its best record last week. This well is near the Henshaw Corp. producer referred to and at first appeared to be a 200-bbl. producer. On its initial pump test it made 600 bbls. and the best gauge was made last week.

In that area Louisiana Oil & Refining Corp.'s No. 1 Kloh-Rumsey, Section 3, Block 32, is drilling in lime at 2,841 feet and has not had an increase since 2,473 feet. Same company's No. 1 Settles, Section 6, Block 32, is drilling lime at 2,065 feet.

Ward County

Ward County's pool opener, Shipley and associates' No. 1 Hazlett, Section 17, Block 5, made 125 bbls. by heads and is showing improvement. It is now heading every 24 hours whereas it formerly headed every 36 hours. Total depth is 2,481 feet. Southwest of this well Rector Oil Co.'s No. 1 Johnson, Section 10, cleaned up its fishing job, made 5 feet of hole and shut down to clear titles. This well had a show of oil at 2,085 feet where a fishing job developed.

Kingwood Oil Co.'s Irion County test in the SE of Section 19, Block 1, H.&T. C. Survey, bailed 25 bbls. of oil and 40 bbls. of water on a test. The water is coming from 2,192 to 2,228 feet. Six-inch casing is swinging at 3,360 feet. The pay was topped at 3,368 feet and total depth is 3,375 feet. The test is shut down for engine repairs.

The Waddell Pool's fourth test was shot Sunday and is showing for a well. It is the Gulf company's No. 5 Waddell, SE cor. NE, Section 11, Block 25, Crane County and was shot with 120 quarts at 3,337-64 feet. Four hours later it flowed 25 bbls. and two and one half hours later it made 10 bbls. Tankage is being erected for further testing.

Production Increase

Production of West Texas showed a 7,580-bbl. increase mainly because Winkler County and Howard County production was up due to gauges being made for proration purposes. Jones County also contributed to the increase with several new wells putting a good amount of flush production in that county's production report.

Estimated Daily Average Production in West Texas for Week Ended November 17

	Bbls.
Hendricks	150,221
Yates	71,486
Remainder	116,120
Total this week	337,827
Total last week	330,247
Difference	7,580

WEST TEXAS COMPLETIONS

Week Ended November 17

Brewster County

Reese & White's No. 1 Kimball was dry and abandoned at 2,265 feet.

Howard County

Atlas Drilling Co.'s No. 1 Hamlin, located on common corner Sections 7, 8, 17 and 18, Block 32, Township 2n, T.&P. Survey, location was abandoned. F. H. E. Oil Co.'s No. 7-E Dora Roberts, located 330 feet from north and east lines of Section 136, Block 29, W.&N.W. Survey, topped the pay at 3,035 feet, was drilled to a total depth of 3,045 feet and had an initial production of 1,235 bbls. in 18 hours. Marland Oil Co.'s No. 10-A Clay, 250 feet from north and 1,962 feet from east line, Section 139, Block 29, W.&N.W. Survey, topped the pay at 1,772 feet, was drilled to a total depth of 1,798 feet, shot with 50 quarts at 1,772-93 feet and had an initial production of 65 bbls. Taylor Link Oil Co.'s No. 1 Kloh, 330 feet from south and 2,310 feet from west line of Section 3, Block 32, Township 2s, T.&P. Survey, topped the lime at 2,131 feet, topped the pay at 2,260 feet, drilled to a total depth of 2,389 feet, plugged back to 2,375 feet, was shot with 400 quarts at 2,260-2,357 feet and had an initial production of 960 bbls.

Jones County

Campbell and others' No. 1 Berry, 660 feet south and east of NW cor. of north 80 acres of east 100 acres of N half Section 15, Block 2, S.P.R.R. Survey, was dry and abandoned at 2,602 feet. Eastland & White Eagle Oil & Refining Co.'s No. 1 Derrick, 200 feet south and west of NW cor., Section 53, Block 18, T.&P.R.R. Survey, was dry and abandoned at 2,987 feet. Phillips Petroleum Corp.'s No. 1 Windham, 330 feet north and west of SE Section 17, Block 19, made 180 bbls. at 2,485-93 feet. Reeser & Pendleton's No. 1 Grayson-B, 330 feet north and 288 feet west of SE cor. of J. A. Grayson Survey 3-A-1,771, made 135 bbls. at 2,555-60 feet. Sinclair Oil & Gas Co.'s No. 1 Bickley made 280 bbls. at 2,472-78½ feet. The Texas Company's No. 2 Carter, 812 feet north and 320 feet east of SW of Laura Carter

(Continued on Page 142)

WILDCAT OPERATIONS IN WEST TEXAS

Week Ended November 17

ANDREWS COUNTY

Company, farm and location—	Remarks—
Deep Rock Oil Co.'s No. 1 Hostetler, 2,310 ft. N and W of SE cor. Sec. 20, Blk. A-46	Drlg. 168 ft. in sand.

BORDEN COUNTY

Condor Oil Co.'s No. 1 E. A. Hall, 1,650 ft. S and W of NE cor. Sec. 5, Blk. 32, Twp. 3n. T.&P. Sur.	Top salt 1,235 ft.; set 6-in. casing 1,805 ft.
E. L. Doheny, Jr., No. 1 J. J. Koonsman, 330 ft. S and E of NW cor. Sec. 2, Blk. 2, T.&N.R.R. Sur.	Hole full water 290-360 ft.; hole full water 3,050-85 ft.; drlg. 3,340 ft.

BREWSTER COUNTY

Texas & Wheeler's No. 1 Long, 1,320 ft. N and E of Sec. 27, Blk. 30, T.&P. Sur.	Location
Brewster Oil Co.'s No. 1 fee, 2,640 S and 2,598 E of NW cor. Sec. 45, Blk. G-15, G.C.&S.F.	Rigging up.
Cowden & Bowser's No. 1-A Jackson & Harmon, Sec. 1, Blk. 331, T.C.R.R. Sur.	Set 8-in. 1,530 ft.
Forrest Oil Co.'s No. 1 Skinner, C SW SE Sec. 100 Blk. 2, G.C.&S.F. Sur.	Shut down 1,145 ft.
J. M. Hickey's No. 1 Jackson & Harmon, NE cor. Sec. 182, Blk. 9, G.H.&S.A. Sur.	Shut down 1,079 ft.

(Continued on Page 95)

The benefits accruing to the oil industry of the United States in its fight for conservation and against overproduction have been so evident to the world at large that an international conference on conservation is now planned

Meanwhile foreign refiners are installing units of the Dubbs Cracking Process in large numbers, because it alone will give them the maximum of gasoline from each barrel of crude This is true conservation

Thus these foreign refiners are already definitely cooperating with their brothers in the United States

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

Well Back Pressure and Fluid Levels

Submergence and Other Factors Entering Into Production Discussed by Air and Gas Lift Authority

By S. F. Shaw*

In a well that is not flowing, the fluid level will rise in the course of time to a point at which the weight of the column of oil is equal to the rock pressure, and it will remain stationary at this level until certain forces lower this level. This column may be measured in feet, or in pounds per square inch. If the depth of the column and the average specific gravity of the oil be known, the height in feet ot the column can be computed. In the absence of more accurate measurements, it has been customary to estimate the height of the fluid level from the pressure at the bottom of the column, by dividing the pressure in pounds per square inch by 0.434 to obtain the equivalent column of water and then dividing this quotient by the specific gravity of the oil, thereby obtaining the equivalent column of oil. This method is not strictly correct since the oil is mixed with a certain amount of gas which makes it lighter than when separated from this gas, and would result in a greater height of the column than that computed. For most purposes, however, the calculated height of the oil column will serve as a fair approximation.

We might assume, for example, that the rock pressure is such as to cause the oil to stand at a point such as "a" in Figure A, equivalent to, say, 250 feet. If the specific gravity of the oil is 0.9, and assuming that there is no admixture of gas with the oil, this height would be equivalent to a pressure at "f" of 250 by 0.434 by 0.9, or 97.65 pounds per square inch. Let us assume that the oil is removed at the rate of 500 bbls. per day, or at a rate that will lower the fluid level to "b;" the fluid level will be 200 feet in height, the pressure "f" will be 78.12 pounds, and the differential between the rock pressure and the pressure when flowing at 500 bbls. per day will be 97.65 pounds less 78.12 pounds or 19.53 pounds. The back pressure when the oil stands at "a" is 97.65 pounds and when standing at "b" it is 78.12 pounds. If the oil level be lowered successively to points "c," "d," "e," and "f," by removing, say, 800, 1,000, 1,100 or 1,110 bbls. per day, respectively, the pressure at "f" would be 58.59 pounds, 39.06 pounds, 19.53 pounds and 0 pounds per square inch, respectively. It will be noted that the assumption is made that for each successive lowering of the level by 50 feet the rate at which the oil is increased per day is reduced, although the total production per day is increased. It will be noted that there is assumed to be very little increase in production over the previous rate when the last 50 feet is lowered, that is, when the oil level stands at "f." This is in accord with actual observations in certain fields, although the rate of change will vary in every well and in every field. It is not possible to determine, previous to making a test, just what these changes will be in any given well. The changes in the level of the oil, and consequently in the pressure at "f," are determined by the rate at which the oil is lifted from the well. This does not depend, so far as my observation extends, upon the method of lifting, whether it be by means of natural flow, gas lift, pumping, bailing or swabbing, assuming that a steady production be maintained by whatever method is employed.

Lifting the Crude

If the casing in Figure A be closed tightly at K, it is probable that in the course of time gas would arise in the casing and gradually displace the oil, and the actual oil level would be depressed to some point just above "f," perhaps to the top of the oil sand, but the pressure at "f" would remain unchanged, that is, it would be same as that of the rock pressure if sufficient time be allowed for an equilibrium to become established, and in this case the oil level would be only a theoretical level, that is, one that is equivalent to the pressure at "f."

The net height to which the oil must be lifted in each of the cases cited would be the distance to the top of the well measured from "a," "b," or "c," as the case might be. When producing at 1,000 bbls. per day, the lift would be 100 feet greater than when producing at "b," or at the rate of 500 bbls. per day.

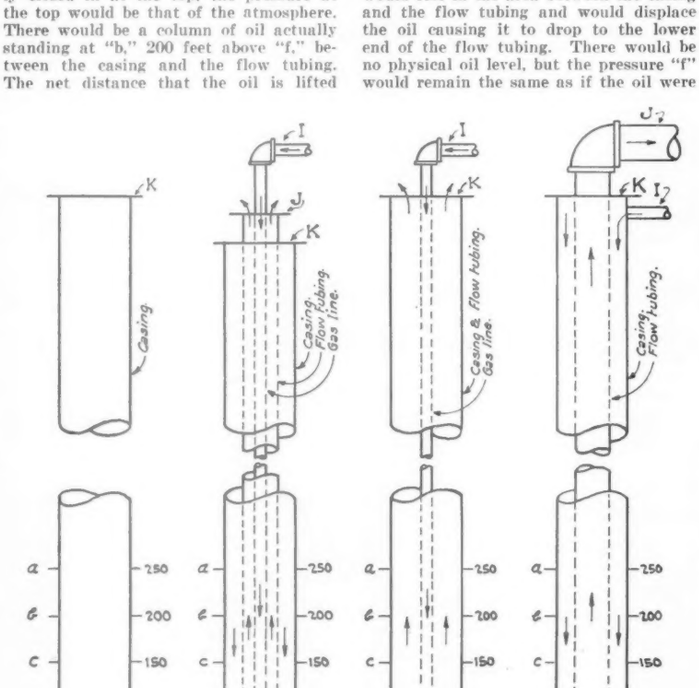
In Figure B, there is shown a casing within which there is hung a tubing, and within the tubing there is suspended a gas line, open at the lower end for admitting gas to the flow tubing. Let us assume tentatively that there is no gas with the oil, and that in order to lift the oil it is necessary to admit gas to the gas line. If the oil level be standing at "a," or 250 feet above "f," and the rock pressure be 97.65 pounds, as previously assumed, there would exist the same oil level in all three lines, that is, the casing, the flow tubing and the gas line. If, then, gas under sufficient pressure and in sufficent volume be admitted to the gas line to lift 500 bbls. of oil per day, the oil would be displaced entirely from the gas line into the flow tubing, and a flow would be set up in the flow tubing with pressure of 78.12 pounds at "f," resulting in a gassified mixture of oil varying in density from the bottom to the top of the flow tubing; and if the flow tubing is not constricted, or "pinched" or partly closed in at the top, the pressure at the top would be that of the atmosphere. There would be a column of oil actually standing at "b," 200 feet above "f," between the casing and the flow tubing. The net distance that the oil is lifted would be the distance from "b" to the top of the well at J, at which point the oil is assumed to be discharged. The distance from "b" to the lower end of the gas line would be the submergence of the gas line and would be slightly less than 200 feet, that is, it would be 200 feet less the distance that the end of the tubing stands above "f." If we admit sufficient gas to lift 1,100 bbls. per day, the fluid level would drop to "e," the pressure at "f" would be 19.53 pounds, the submergence would be slightly less than 50 feet, and the lift would be the distance from "e" to the top of the well. The gauge pressure in the gas line at I would be the pressure at the lower end of the tubing plus the friction loss due to the gas being forced through the gas line to the bottom of the well. The gauge pressure in the gas line at the surface may be far from being the pressure at the lower end of the gas line. In a series of friction tests made with 4,000 feet of 2½-inch upset tubing, it was found that to drive 1,325 cubic feet of air through this line and to maintain a pressure of 4 pounds at the discharge end of the line would require a pressure of 172 pounds at the input end of the line. From this it can be seen that the friction loss may be a very important matter to determine, in order that the feet of submergence and the feet of lift may be ascertained.

If There Were No Gas in Oil

For the purpose of simplifying the explanation of submergence it has been assumed that there be no gas associated with the oil; this is very seldom the case, however. If there be gas in the oil, as in the example assumed with Figure B, and if the casing be closed at K, the gas would rise in the area between the casing and the flow tubing and would displace the oil causing it to drop to the lower end of the flow tubing. There would be no physical oil level, but the pressure "f" would remain the same as if the oil were standing at "a" or at "b," as the case might be. A pressure gauge at K would indicate the pressure existing at the lower end of the flow tubing, allowing, of course, for the additional pressure due to the weight of the standing column of gas, and would be practically the same pressure as that existing at the lower end of the gas line. There would not be an actual fluid level, but the pressure condition would supply the same data as if the oil level actually existed, and from this the feet of submergence and the feet of lift can be readily calculated.

If the condition in Figure C be considered, where a gas line extends to a point close to the bottom of the well, and gas admitted at such pressure and volume as to lift 500 bbls. per day, there would be no actual fluid level, but the pressure at "f" would remain as before at 78.12 pounds equivalent to an oil level of 200 feet standing at "b." Likewise, in Figure D where a flow tubing is suspended in the well and the gas admitted at I, and if 500 bbls. per day be lifted the pressure at "f" would be 78.12 pounds and the theoretical fluid level could be calculated thereby determining the feet of submergence and the net distance in feet to which the oil is lifted.

If there were sufficient gas with the oil to flow the oil without the aid of external gas, and if the flow tubing were suspended in the well as in Figure D, with gauge at K, there would exist similar conditions to that if the gas were supplied to the well; the gauge at K would register approximately the pressure at "f," or more exactly it would register the pressure at the end of the tubing to which pressure should be added that due to the weight of the static column of gas. From the pressure so obtained, the theoretical oil level, and the submergence can be calculated, also the net theoretical distance to which the oil must be lifted.



Submergence

Submergence is the term that has been applied to the depth to which the air or gas line is submerged in the liquid that is being lifted. The starting submergence in the example illustrated in Figure C is the depth in feet below "a" to which the gas line is lowered, and if lowered to "f," the starting submergence would be 250 feet and the equivalent pressure would be 97.65 pounds. In this case, however, the starting pressure would be somewhat greater than 97.65 pounds owing to the fact that on starting to admit gas into the gas line there is a certain quantity of oil in this line that must be displaced and which cannot re-enter the oil sand in the short time that would be required to admit the gas, and consequently must enter the space between the tubing and the casing. The starting pressure will be increased by the height to which the level of the oil in this space has been raised.

Working submergence, or operating submergence, is the depth of the fluid, actual or theoretical, above the lower end of the gas line when the well is flowing. Thus, when producing 500 bbls. of oil per day the operating submergence is approximately 200 feet, or 78.12 pounds, and when producing 1,100 bbls. per day, the operating submergence is 50 feet or 19.53 pounds.

It is necessary to make an estimate of the submergence in order to ascertain the height to which the fluid is lifted. Both the submergence and the lift must be known in order to calculate the efficiency that is being obtained in the operation.

Back Pressures

The question of back pressure is one that is subject to considerable misunder-

(Continued on Page 117)

*Before Mid-Continent District American Petroleum Institute Division of Development and Production Engineering. Paper released by Mid-Continent district committee.

Causes and Effects of Crooked Holes

Excessive Weight Considered Primary Reason in Many Cases. Speed Offset by Subsequent Difficulties in Operation

By E. J. McKee*
Chairman, Mid-Continent Committee on Drilling Practice

This paper is not prepared with the idea of offering a cureall for crooked holes and their effects on the production of oil, but with the idea in mind of trying to point out the magnitude of their influence on this industry from an operation and economic standpoint, so that they may be taken up and discussed by competent members of the oil fraternity and means obtained whereby, if possible, a more comprehensive study of their causes and effects can be made. Should this study be undertaken, the result and conclusions will be available for all members of the American Petroleum Institute.

The writer wishes to thank his coworkers on the committee and all others who assisted in the preparation of this paper by furnishing of whatever data it contains.

Deviation in bored holes, or "crooked holes," has become noticeable to the oil industry development and operation in recent years in an ever increasing quantity. It is a known fact that crooked holes have an economic bearing on the development and operation of an oil property. These points will be discussed later on.

Crooked holes that are encountered today and are being brought to the attention of the industry, in the majority of cases are in those drilled by rotary tools. However, it is known that they occur in cable drilled holes as well, and in the majority of cases increase with greater depths drilled by this method. In this paper, however, we shall consider only rotary method of drilling.

Causes of Crooked Holes

There are two main causes of crooked holes. The first is due to abrupt inclination in the plane of the formations encountered during drilling. The inclination may be due to several different geological reasons, discussion of which will not be entered into at this time. The operator or contractor has no control over these causes whatever. However, it is essential when he does encounter a condition brought about by the above reasons, to use good judgment as well as good equipment and labor to overcome the difficulties which have been imposed upon him by nature.

As to the second, this in the majority of cases seems to be brought about by one or more of the following reasons, either separately or in combination:

1. Not starting hole straight.
2. Excessive weight on cutting tool.
3. Rotating at too great a speed.
4. Flexure or distortion of drill column due to either of the above, or the two in combination.
5. Mud of improper consistency.
6. Improper and inadequate equipment.

And many others too numerous to mention. When either of the above occurs, there is a tendency of the drill stem to corkscrew in the hole, seeking to relieve itself of the excessive stresses under which it is working. It is not necessary to draw on the imagination to any great extent to see readily what will occur in the case you are drilling in a soft material and encounter a hard or dense formation inclined at rather a steep angle. Naturally the bit would follow the line of least resistance. When this is done, you have a crooked hole already started and in the majority of cases very hard to remedy. However, excessive weight seems to be the primary cause of deviation in many cases.

Excessive Weight

In support of the above the following evidence is pertinent:

A well was recently drilled in southeast Colorado in which the top of the granite was encountered at 1,865 feet. Below that point 224 feet of granite was penetrated. The well reached a total at the time it was plugged of 2,089 feet. It was an 11-inch hole and new 6-inch, 25-pound drill pipe and tool joints were employed. The granite was extremely hard and abrasive, being sufficiently hard to scratch glass. Now, if it were assumed that the column of drill pipe under the load set on the bit during the drilling was insufficient to cause flexure wear on all the tool joints which were down in the granite formation, it would be evenly distributed around the entire surface. This did not prove to be the case; indeed, the tool joints without exception showed a considerable wear on relatively small parts of their circumference. In other words, they did not wear to a true circle as might have been expected, but tended to elliptical in cross section. This can be explained in only one way, that sufficient weight was set on the bit to cause the drill pipe to bend away from the center of the hole out against the walls of the hole, and to rotate in that position, each tool joint rubbing at one point against the side wall during each complete turn of the pipe. It should be borne in mind that this occurred with new 25-pound drill pipe, which is heavier and has much more resistance to flexure than the 22-pound pipe commonly used in Mid-Continent drilling.

High Bit Pressure

It might naturally be assumed that such a condition resulted from using a very high bit pressure, but the facts are to the contrary. A careful check of the weight carried on the bit while drilling the granite, shows an average of only 28,000 pounds with a maximum for a very brief period of 35,000 pounds. The condition of tool joint wear just mentioned was exaggerated on this particular well by reason of the formation being so hard and abrasive. It is not comparable at all to anything encountered in Oklahoma, but, if here in Oklahoma formations such as the granite were commonly drilled, it is believed that similar conditions would be noticed, and probably would be exaggerated where lighter drill pipe having less resistance to bending under load was employed.

It is rather difficult to set up any rule for the average bit pressure to be used in the Mid-Continent area, but from information gathered from different contractors and operators in this area there seems to be a tendency to run between 40,000 pounds and 60,000 pounds at depths below 2,500 feet. This is subject to wide variations with different drillers and contractors. However, if an average of 28,000 pounds will produce the results as noted in Colorado in throwing the drill pipe out of center with relationship to the hole, it is very apparent that in the vast majority of wells drilled in Oklahoma the same condition will be obtained. Taking into consideration the diameter of the new 6-inch tool joint which is 7¾ inches in an 11-inch diameter hole its axis may be thrown off center 1⅝ inches if the drill pipe is subject to flexure from weight imposed. In actual practice most of the tool joints in use today will probably not have an outside diameter exceeding 7½ inches which would permit the pipe under load to flex 1¾ inches off center. In a 12-inch hole the limit of flexure is further increased to a figure of about 2¼ inches. In the event of a crevice, it is evident that still greater flexure may occur.

Slush Pump Pressures

It is generally accepted that a hole is not the exact diameter of the bit at all points. It is quite evident that with high slush pump pressures and volume the washing or eroding of the hole in soft formation is considerably in excess of the diameter of the bit size. Should this condition arise, it is obvious that the limits of drill pipe flexure may vary considerably, increasing with the consequent increase in the chance for the bit to be guided away from the plumb hole. If the weight usually set on the bit is sufficient as contended to cause just a few feet above it a bend in the string of pipe to the proportions noted, then it is certain that the bit instead of being true to the angle of the hole already made will actually be guided away from such angle, and that generally the hole might be expected to assume a long right hand spiral due to the fact that in drilling the bit is rotated to the right. Investigations with reference to crooked holes show that such is generally the case. The following is a table showing the actual weight of a string of 6-inch drill pipe with tool joints, rock bit and drill stem at varying depths. It is assumed in these figures that of the total weight, 16 per cent will be buoyed by the mud-laden fluid in the hole and that amount is deducted in the figure shown:

Depth	22-pound drill pipe	25-pound drill pipe
1,000 feet	26,400	28,900
1,500 feet	36,900	40,700
2,000 feet	47,400	52,400
2,500 feet	57,900	64,200
3,000 feet	68,400	75,900
3,500 feet	78,900	87,700
4,000 feet	89,400	99,500
4,500 feet	99,900	110,200
5,000 feet	110,400	123,000

Weight on Cutting Tool

An examination of the above will indicate that at a depth of not exceeding 1,500 feet there is more than sufficient weight, if the premises previously advanced are accepted as correct, to cause flexure of the drill pipe at 3,000 feet. It will be noted that there is a total weight of approximately 70,000 pounds in drill pipe column, yet it is not exceptional at all to find operators imposing practically all of this weight on the cutting tool at that depth. At depths below 3,000 feet it is perfectly obvious that a considerable portion of the weight should be suspended on the hook rather than set on the bit, but it is the writer's opinion based on observations that in a vast majority of cases not to exceed 50 per cent of the total is so sustained.

Explanation for this condition is at once clear. There is a definite relationship between bit pressure when running a rock bit such as is commonly used in the Mid-Continent fields, and cutting speed per unit of time. From data furnished the writer it appears that a general average of 1 foot per hour per 10,000 pounds of weight on the bit can be drilled at below 2,500 feet. It follows, that ordinarily the contractor or driller whose primary interest is making a hole, at least tends to impose excessive weight on the cutting tool. If at 60,000 pounds bit pressure an average drilling speed of 6 feet per hour can be maintained and, if with 30,000 pounds the cutting speed is reduced to one-half the figure, the chances are much in favor of the first-named pressure being employed, unless intelligent supervision is exercised.

Flexure of Pipes

From data furnished by a contractor in the Mid-Continent area, some very interesting details have been brought up relative to the flexure of pipes. In the course of drilling, the string of drill pipe in the hole becomes a nonrigid column, supporting the cutting tool. Whatever the amount of weight the operator considers advisable, it is imposed for the purpose of forcing the bit to cut. If the total weight imposed is not sufficient to cause flexure in the string of drill pipe, it may be assumed that it will center itself in the hole with relation to the bit. However, such does not appear to be the case; instead, it seems from data which are available, that even at a comparatively shallow depth the average weight carried on the bit is sufficient to overcome the resistance of the drill pipe to flexure or bend, and instead of centering itself in the hole the tendency is to bend or kink to the limits permitted by the walls of the hole, with such tendency ever increasingly exaggerated at the greater depths, as more weight is set on the bit. Consequently, the drill pipe becomes an elongated corkscrew, and instead of being a guide to keep the hole plumb it has an opposite action. In all the data obtained, the writer was unable to secure any information from which the influence of torque on the flexure of drill pipe could be ascertained. It is agreed that it has a bearing on operation, but as to how much it is not definitely known.

Another factor which may be contributed to crooked holes is the condition of which the drill pipe immediately above the cutting tools is in, as well as the condition of the drill pipe. It is very evident that for good drilling practice it is necessary that the drill pipe be as nearly straight as is possible, thereby eliminating any possible chances for short kinks or bends which have a tendency to cause the cutting tool or pipe to rotate with an eccentric motion.

Self Centering

It is also advisable and considered good practice in starting a new or smaller hole under a string of casing, to use a self-centering tool. For instance, if a 16-inch A.P.I. surface casing with inside diameter of 15¼ inches is set, it would be quite possible for an 11-inch bit to start under it 2 inches off center. The average contractor or operator has different ideas as to starting a hole in the exact center under the casing just set.

It is thought that the foregoing explains many of the causes of crooked holes. However, a lot of the foregoing causes will be eliminated by close supervision of operations, taking advantage of all types of control apparatus which are on the market, and the use of up-to-date equipment and watching the operation. This is within the control of the contractor or tool operator. However, there is another factor which it is believed should be considered at this time. We have a very striking example in the development of our Seminole Field. It was a case of getting the footage and to the top of the sand as quickly as it could be done. In other words, as expressed by some operators, "Get it in the sand yesterday if possible." When conditions like this arise, the operator is nearly always actuated by the possibility of offsetting production. The producers urge the contractors or operators to use all possible speed and heavier equipment to get a well in as quickly as possible. Naturally he is going to try to make good, doing so with a view in mind that if he makes good in this particular location he may be able to get another. The result is that he is at his men's backs all the time, urging them to put forth their utmost efforts to bring the well in as quickly as possible. When such conditions exist, it is a tendency of human nature to overlook and do things which in more sane moments would not even be considered.

The tool operator may know that he is liable to encounter trouble by this hurry up method of development, but reasons that he can get a hole down to

(Continued on Page 119)

*Before Mid-Continent District, A.P.I. Division Development and Production Engineering. Released by Mid-Continent District Committee.

Seminole and St. Louis Areas Decline

Oklahoma Production Continues on Downward Trend. Failure in South St. Louis Important Factor in Situation

By J. L. Dwyer
Staff Correspondent, Oklahoma Fields

Another drop in the daily average output of Oklahoma was this week confined principally to the Greater Seminole and St. Louis regions which continue to decline. There was little in the Greater Seminole area to stem the drop, but the completion of one big Wilcox sand well at St. Louis, and the deepening of another with a substantial increase, was slightly surprising, as it had been thought that they would offset any drop in production.

A showing of oil in a wildcat well, a big well at St. Louis with the deepening of another, and a Wilcox sand well which is practically dry and which cuts off the St. Louis most recent discovery to the south were the important events of the week.

The showing of oil was in the Superior Oil Corp.'s No. 1 Herminghausen, SW cor. NW NE, Section 24-8-2, which cored a saturated sand reported from 4,927-41 feet. While exact determination of the formation has not been made it is believed to be the Hunton lime. This showing is believed to be exceptionally important, for while it may not be sufficient to make a well, the fact that the Hunton carries oil in this locality will lend much encouragement to exploration work. The Hunton having a depth of 4,927 feet in this location, it is believed the Wilcox sand will be found much too low to produce any oil, but it is quite possible the Hunton showing will cause some work to be done in this vicinity in the hope of finding a Wilcox high.

The Superior well is 9 miles northwest of the Pearson Switch Pool of Pottawatomie County which is also a Hunton lime producing area. It is 21 miles west of the Bowlegs Field.

In 25-7-4

The territory around Section 25-7-4, attracted fresh interest 10 days ago when The Texas Company and Fuhrman Petroleum Co.'s No. 1 Cherry, SW cor. NW NW Section 25-7-4, began flowing 100 bbls. an hour from the Wilcox sand. During the past week the Magnolia Petroleum Co.'s No. 1 Cherry-A, NE cor. SE NE Section 26-7-4, a diagonal offset to the Texas-Fuhrman well, began flowing 230 bbls. an hour from Wilcox sand found 4,278-85 feet. Immediately after the Magnolia well was drilled in, the Texas-Fuhrman well was deepened and responded with a flow of 215 bbls. an hour. These wells are each producing around 5,200 bbls. daily. In reporting the 25-7-4 activity last week, this department commented that it was possible the new find would cover a very limited area, and this seems partly to have been borne out by the failure of the Mid-Kansas Oil & Gas Co.'s No. 3 James, SW cor. NW Section 25-7-4, one-quarter mile directly south of the Texas-Fuhrman well. The Mid-Kansas well had the Wilcox sand at 4,389-4,407 feet and swabbed 70 bbls. of oil daily with 1,500 feet of water in the hole, and the amount of water increasing each hour. It seems to have definitely marked the south boundary of the new pool. To the north and northeast, the presence of water in the Simpson sand seems to have eliminated any chance of the Wilcox sand production carrying in this trend. There is no logical reason for the fact that water in the Simpson is always accompanied by water in the Wilcox, but it has never failed in this section of Oklahoma. The extension of any Wilcox sand production to the north or northeast is therefore negligible, and with the failure of the well one-quarter mile south there is only one direction for the production to go and that is west. It now seems reasonable to believe that the new pool will cover an area not larger than 300 acres.

The delimiting of this pool to the south is exceptionally important to the future of Oklahoma Wilcox sand production, as had a pool of large area been visualized, the crude market would have been weakened perceptibly.

There was practically no change in the status of the Bowlegs, Seminole City and Searight Pools during the past week. The very few drilling operations in these pools were unimportant, and were inside locations which were offset by wells which have for a long period exercised heavy drainage upon the locations now being drilled. The few attempts to extend the borders of the producing territory of these pools have been futile, and the pools must be regarded for the present at least as settling down into the setting sun of their producing days.

East Little River

With the 25-7-4 activity discounted to a large extent, the Mission region, the East Little River Pool, and extensions of both the northeast and west parts of Earlsboro are the most interesting spots in the south country. In the East Little River operation at least, there are several wells now close to the Viola lime which should be completed within the next 10 days or two weeks, and a much better idea of the pools' possibilities should be available. This operation was originated by the Mid-Continent Petroleum Corp.'s No. 1 Smith, NW cor. NE Section 5-7-7. This well was shut in for one year, and after being opened up, responded with a limited flow. The region experienced a few Wilcox sand dry holes, and was cut off from the main body of Little River production in two directions, west and southwest. Interest in this region lagged after the completion of these failures, and was revived a few weeks ago when the owners of the Mid-Continent well began slowly drilling their well deeper. The well was deepened 1 foot at a time, and each time responded with an increase in output. The top of the Wilcox sand in this well was 4,425 feet, and the present total depth is 4,429 feet. Deeper penetration has increased the output of the well from 2,465 bbls. to the present figure of 3,690 bbls. daily. This substantial increase in the production of the discovery well has to a large extent overcome the feeling that the region would be a disappointment, and the completion of the wells now drilling in this vicinity will be of exceptional interest.

Southwest of the Mission Pool, and about midway between the Maud and Mission regions, T. B. Slick, Inc., has an important failure in No. 1 Tiger, NW cor. SW SE, Section 13-8-5. This well had the Wilcox sand 4,407-23 feet and is still drilling at that depth with a hole full of water. Its failure cuts off any further possibility of a southwest extension of the Mission area, and since the well had been regarded as running much higher than the Carter Oil Co.'s Fuswa well in Section 18-8-6, which found the Wilcox sand at 4,629 feet, and still made a good producing well. The failure of the Slick well helps to limit the possibilities of the Mission area.

West of Earlsboro

There has been considerable interest on the west side of the Earlsboro Pool since the Atlantic Oil Producing Co. and the Gypsy Oil Co.'s No. 1 Delaware, SE cor. NE NE, Section 13-9-4, touched the Hunton lime at 4,205 feet. This well made several small flows, and looked like a good Hunton well, but water trouble, the origin of which is not known, has dimmed the enthusiasm regarding the well. The water may be coming from the Hunton and may be coming from up the hole, and the owners are working with the casing trying to get a good water shut-off. This well if a producer will extend the Hunton lime area slightly to the west.

In the northwest part of the pool, the Mid-Continent Petroleum Corp.'s No. 1 Rogers completed several weeks ago is still maintaining a good rate of flow. This well is SE of SW, Section 5-9-5, and it extended the production of this part of the pool several locations to the west. The well made 1,000 bbls. initially, and it is now making 1,120 bbls. daily.

In the northeast extension of the Earlsboro Pool, T. B. Slick, Inc., and others' No. 1 Campbell showed an exceptional improvement after a shot of 30 quarts. This well is SE cor. NW, Section 6-9-6, and before the shot it had a very small showing. The Wilcox sand in the well was drilled from 4,332-70 feet, and after the shot, the well made 3,500 bbls. daily. No. 2 Campbell, NE cor. SE NW, Section 6-9-6, was shot with 60 quarts and is now flowing 1,440 bbls.

Mission Area

Now that the drilling campaign has started in the Mission area, much interest is manifested in that region. The Marland Oil Co. and the Shell Petroleum Corp. (formerly Roxana) have completed their No. 1 Herndon, NW cor. NE, Section 7-8-6. This well had the Wilcox sand 4,278-91 feet, and swabbed 800 bbls. in 19 hours. It is to be shut in until the date of opening the wells which are now drilling, namely February 15, 1929.

The oldest producing well in the Mission Pool is the Gypsy Oil Co.'s No. 1 Dosar, SE cor. NE Section 7-8-6, which was shut in completely for several months, and which has recently been producing 50 bbls. daily. This well will be permitted to flow open for a brief period according to reports from the field. The well was completed November 9, 1927, for 2,600 bbls. daily from sand 4,464-66 feet, and has not been deepened since that time.

Now that the possibilities of the Wilcox sand have been rather fully realized in the various Seminole Pools, some interest is being given to the shallow formations. There have been numerous shallow showings of oil which were quickly passed over in the rush to obtain the Wilcox oil. The most recent event in the shallow sands is W. B. Pine's No. 2 Harjo, SE cor. SW SE Section 6-8-6, which had a good showing from 411-425 feet. The showing of oil came up through 250 feet of water and 75 feet of cavings. This well was shot with 40 quarts at this depth and is now being cleaned out.

WILDCAT OPERATIONS IN OKLAHOMA

NORTHERN OKLAHOMA

LATIMER COUNTY

Limestone Oil & Gas Co.'s No. 1 McMurray, SW cor. SW Sec. 15-5-18 ..... Shut down 2,800 ft.

GRANT COUNTY

J. V. Bailey and others' No. 1 Maddox, C SE Sec. 18-27-5w ..... Dry and abandoned 5,058 ft.
Cowden and others' No. 2 Vollmer, CEL NE SW Sec. 22-25-4w ..... Shut down 5,640 ft.

HARPER COUNTY

Hoffer Oil Co.'s No. 1 Cooper, NW cor. SE SE Sec. 12-25-22w ..... Shut down 4,130 ft.

KAY COUNTY

Geo. L. Miller and others' No. 1 Home, NW cor. SE Sec. 11-24-3 ..... Dry and abandoned at 4,031 ft.
Lario Oil Co.'s No. 1 McKay, NW NE Sec. 14-29-1 ..... Drlg. 3,105 ft.
Tonkawa Development Co.'s No. 1 McDaniels, SE cor. SE Sec. 15-25-1w ..... Wilcox sand 4,915-4,926; dry and abandoned.

WOODWARD COUNTY

Otstot Development Co.'s No. 1 Simmons, SE cor. SE Sec. 32-24-17w ..... Shut down for pipe 1,490 ft.
Sharon Oil Co.'s No. 1 Elmore, SW cor. SW Sec. 25-21-21w ..... Rig blown down 3,025 ft.
Billy's Oil Co.'s No. 1 Watt, C SE Sec. 9-23-20w ..... Shut down 500 ft.
Burgoyne Brothers' No. 1 Merkins, SW cor. SE NE Sec. 15-21-19w ..... Underreaming 1,810 ft.
Farrond and others' No. 1 Johnson, SW cor. SW Sec. 1-23-17w ..... Underreaming 1,560 ft.

GARFIELD COUNTY

E. L. Love and others' No. 1 White, SE cor. NW Sec. 9-24-6w ..... Shut down 4,755 ft.
Marland and Barnsdall's No. 1 Looman, NE SE Sec. 9-20-4w ..... Shut down 5,735 ft.
Marland Oil Co.'s No. 1 Miller, SW cor. SW Sec. 12-20-4w ..... Shut down at 4,575 ft. waiting on test Sec. 9-20-4w.

NOBLE COUNTY

Alco Royalty Co.'s No. 1 Waltermire, SE cor. NW Sec. 33-21-1w ..... Casing 765 ft.
Marland Oil Co.'s No. 1 Kidd, NW cor. SW Sec. 32-20-1w ..... Shut down at 5,290 ft.; plugging back to show oil 1,836 ft.

KINGFISHER COUNTY

Galt-Brown Oil Co.'s No. 1 Wolff, NW SE Sec. 6-16-7w ..... Completed contract 4,515 ft.; shut down.
McKinney & Crawford's No. 1 Sturgeon, NE cor. SW Sec. 27-16-6w ..... Drlg. 4,775 ft.

LOGAN COUNTY

Champlin Refining Co.'s No. 1 Clark, SE cor. SW Sec. 8-19-4w ..... Dry and abandoned 6,726 ft.
Margay Oil Co.'s No. 1 Cole, SE cor. SW NE Sec. 24-18-5w ..... Rig.
Haley & Smith's No. 1 Guier, SE cor. SW Sec. 33-18-3w. Shut down, 3,940 ft. corrected.
J. L. Donahoe's No. 2 fee, SW cor. NW SE Sec. 21-18-2w. Drlg. 5,520 ft.

BLAINE COUNTY

Lowen and others' No. 1 Unknown, NW cor. SW NW Sec. 27-16-11w ..... Spudded and shut down; renewing leases.
W. J. Donnelly, trustee's, No. 1 Dickens, NE cor. SE Sec. 26-15-12w ..... Drlg. 4,120 ft.
Ragland and others' No. 1 Unknown, C NW SW Sec. 13-19-10w ..... Rig.

LINCOLN COUNTY

Phillips Pet. Co.'s No. 1 Stephens, SE cor. NW Sec. 29-12-3 ..... Location.
Morgan & Flynn's No. 1 Finlay, SW cor. SW Sec. 19-16-6 ..... Location.

McLAIN COUNTY

Empire Oil & Ref. Co.'s No. 1 Bonner, SE cor. NW NW Sec. 29-5-3 ..... Location.

MUSKOGEE COUNTY

Elk Drilling Co.'s No. 1 Jones, SW cor. SW Sec. 34-13-17 ..... Shut down 400 ft.
L. T. Haney's No. 1 Mitchell, SE cor. NW SE Sec. 33-13-18 ..... Shut down 2,290 ft.

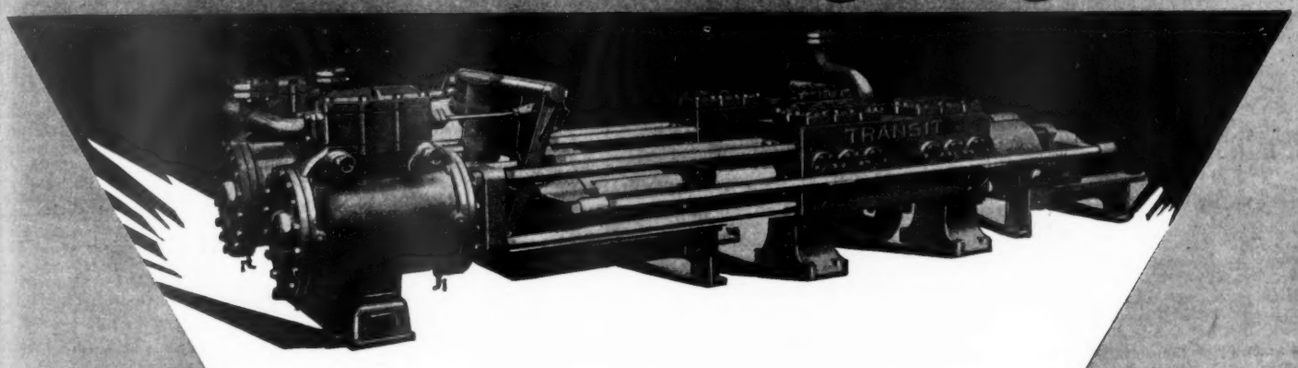
(Continued on Page 113)

TRANSIT

Hot Oil

PUMPS

Are in the spotlight, as the refiners favorite



NATIONAL TRANSIT
Pump & Machine Co.,
Oil City, Pa.

DISTRICT OFFICES
New York Philadelphia Cleveland
Pittsburgh Houston Tulsa Los Angeles

It seems possible that some good shallow production may be developed in the Seminole pools. Some months ago the Reiter-Foster Oil Corp., Wigton & Long completed a shallow sand well in Section 31-7-6, and this well has been holding up remarkably well at 35 bbls. daily. The sand was found at 1,100 feet, and the well was drilled upon the strength of a showing of oil which the Mid-Continent Petroleum Corp.'s Wilcox sand failure just north of it showed.

In the south end of Little River, T. B. Slick, Inc.'s No. 1 Wood, NE cor. SW Section 26-7-6, is still flowing 500 bbls. of oil and 1,000 bbls. of water daily from the Cromwell sand at 3,600 feet.

Pipe Line Situation

The pipe line situation, in the Greater Seminole region, shows little change. The Prairie Pipe Line Co. is reported planning a pump station in Section 23-8-5, which will permit it to run lines and take oil from both the Mission and Maud Pools. The daily average pipe line runs for the week ending Saturday, November 17, follow:

	Bbls.
Shell	13,680
Barnsdall	2,720
Champlin	9,846
Continental	3,009
Consolidated	481
Mid-Continent Petroleum Corp.	10,824
Empire	13,017
Gulf	34,121
Magnolia	23,949
Oklahoma	48,889
Prairie Pipe	60,459
Pure	5,211
Shaffer	4,891
Sinclair	23,190
Texas	14,450
Tidal	14,620
White Oak	2,207
Total	285,564

Daily average tank car shipments for the same period were:

	Bbls.
Amerada	2,833
Carter	4,096
Pure	5,371
Total	12,300

The daily average pipe line runs out of the St. Louis Pool for the same week were:

	Bbls.
Consolidated	7,325
Gulf	9,440
Independent	13,546
Magnolia	25,010
Oklahoma	3,116
Prairie Pipe	34,981
Shell	3,990
Texas	2,061
Sinclair	31,720
Total	131,189

The production of the more important leases in the St. Louis Pool on Monday morning, November 19, follows:

	Bbls.
Barnsdall Oil Co.:	
1 Stahl	902
Gypsy-Sinclair et al:	
1 and 2 Stahl	8,880
4 Stahl	840
5 Stahl	2,880
6 Stahl	2,040
Phillips Petroleum Co.:	
2 Stahl	1,430
3 Stahl	600
Sinclair Oil & Gas Co.:	
1 Nadash	605
Magnolia Petroleum Co.:	
1 and 2 Hembree	5,108
3 and 4 Hembree	4,138
1, 2, 3, 4, and 5 H. E. Youts	5,317
2 C. A. Youts	700
1 T. Fyke A	off air
1 T. Fyke 8	703
1 Cherry A	5,577
T. B. Slick, Inc.:	
1 Hembree	1,265
2 Hembree	4,510
3 Hembree	5,445
4 Hembree	5,597
1 Youts	off
2 Youts	2,320
3 Youts	480
Mid-Continent Petroleum Corp.:	
1 Guinn	1,585
Independent Oil & Gas Co.:	
1 Youts	6,210
2 Youts	885
3 Youts	3,710
4 Youts	2,795
5 Youts	2,545
6 Youts	1,915
7 Youts	1,595
8 Youts	2,275
Prairie Oil & Gas Co.:	
1 Wolfe	730
2 Wolfe	1,070
3 Wolfe	1,290
Texas-Fuhrman:	
1 Cherry	4,525
Total	90,467

Carter County

Devonian Oil Co. made location for No. 1 Myer, NW cor. SE, Section 19-5s-3w. Max Westheimer's No. 2 Dixon, NW cor. SW, Section 18-1s-3w, is an old abandoned well drilling deeper at 3,185 feet. Magnolia Petroleum Co. has the rig up for No. 2 Gill, NE cor. SE SE, Section 23-1s-3w.

Caddo County

George Ray's No. 1 Thatcher, SW cor. NW SW, Section 4-5-9w, was completed for 10 bbls. at 2,446 feet.

Creek County

Gled Oil Co.'s No. 1 Crawford, C SE NW, Section 28-19-9, is spudding. Dixie Drilling Co. and others moved the rig out for No. 1 Roberts, NE cor. SW, Section 30-17-9. Central Commercial Oil Co. has the rig on the ground for No. 1 Hay, NE cor. NW SW, Section 10-17-10. R. E. Freeman has built the rig for No. 1 Porter, SE cor. NE, Section 23-19-7. Bengal Oil Co. has the rig up for No. 8 Tiger, NW cor. SE SW, Section 17-17-7. The Prairie Oil & Gas Co. is moving the rig in for No. 6 Coachman, NW cor. NE NW, Section 20-17-7, Drumright Pool. The rig is also being moved in for No. 7 Coachman, SE cor. NE NW, Section 20-17-7.

Bengall Oil Co.'s No. 6 Tiger, SE cor. NW SW, Section 17-17-7, Drumright Pool, has been completed for 250 bbls. in sand at 2,713-54 feet. W. B. Pine and others' No. 1 Hill, SW cor. NE SE, Section 27-17-7, made 24 bbls. from sand at 2,786-96 feet. No. 2 Hill, NW cor. NE SE, Section 20-17-7, has been completed for 75 bbls. in sand at 2,762-2,800 feet. Twin State Oil Co.'s No. 4 Coachman, NE cor. SW NE, Section 20-17-7, made 425 bbls. from sand at 2,801-46 feet. Wilson and others' No. 1 McNac, NE cor. SW, Section 25-17-8, has been completed for 1,500,000 feet of gas in sand at 2,671-2,726 feet.

Henry & Avers' No. 1 Harris, SW cor. SE SE, Section 12-17-10, made 2,000,000 feet of gas from Taneha sand at 2,275-78. Eliza Tim Oil Co.'s No. 1 Sapulpa, C S half SW, Section 2-17-11, had Dutcher sand at 2,011-19 feet and made 20 bbls. H. C. Wilson's No. 3 Ashbury, NW cor. NE, Section 1-15-10, made 40 bbls. from Dutcher sand at 2,626-96 feet. G. Collins' No. 1 Sapulpa, SE cor. NE SE, Section 3-17-11, is dry and abandoned at 2,017 feet in Dutcher sand. Skelly Oil Co.'s No. 4 Fife, SW cor. SE SW, Section 15-14-8, is dry and abandoned at 3,375 feet.

Comanche County

P. Hrbacek and A. E. Korthaus' No. 1 Wilson, C NE SW, Section 14-1-12w, has been temporarily abandoned at 4,055 feet.

Garvin County

Magnolia Petroleum Co.'s No. 7 Harris, NW cor. SW NW, Section 16-1-3w, is drilling at 1,685 feet.

Grady County

Champlin Oil & Refining Co.'s No. 1 Kerans, NE cor. Section 23-4-8w, is rigging up rotary tools. Oklahoma Gas Utilities Co. made location for No. 6 Chandler, NE cor. SE SE, Section 27-5-8w. Meridian Gas Co.'s No. 2 Hill, SW cor. Section 25-5-8w, was completed for 11,000,000 feet of gas at 2,385 feet after plugging back from 2,445 feet.

Grant County

W. H. Boucher and others' No. 1 Nelson, SW cor. SE, Section 1-27-3w, is a rig moving in. Lario Oil Co. and others' rig is under construction for No. 1 Connell, NW cor. Section 24-28-3w.

Kay County

Ingram & Wilson's No. 2 School Land, NW cor. NE SE, Section 36-28-1w, is drilling at 150 feet for shallow gas. Harold Petroleum Co. is building the rig for No. 2 Case, SW cor. Section 4-27-1w, to deepen an old well. Ingram & Wilson's No. 2 Booley, NW cor. SE NE SW, Section 14-27-1, is rigging up for a shallow gas test. Nuckols & Riggs made location for No. 1 Henkle, SW cor. NW NW, Section 3-26-3. The Prairie Oil & Gas Co.'s No. 2 Hargraves, C SW NE, Section 19-27-1w, which is being deepened, is now fishing tubing at 1,870 feet. Alice Ewing and others' No. 1 Redick, SW cor. SE NW, Section 27-28-2, has been abandoned at 1,020 feet.

Kiowa County

Sloan and others made location for No. 1 Sloan, NE cor. Section 31-6-14w.

Lincoln County

Wilcox Oil & Gas Co. has the rig up for No. 2 Angee, SW cor. SE SW, Section 35-14-6. Carter Oil Co. has the rig

(Continued on Page 120)

FLOODS HAMPER KANSAS FIELD; ELLIS COUNTY WELL HOLDS INTEREST

By J. L. Dwyer
Staff Correspondent, Kansas Fields

Heavy rains with the floods which followed seriously hampered the field operations in eastern Kansas last week, and the impassable roads made traveling to the wells in the western portion of the State almost out of the question.

There were no completions of unusual importance, and the most interesting well is the Phillips Petroleum Co.'s No. 1 Schultz, C NE, Section 5-12-17w, which was reported as filling with oil one week ago. The well is in Ellis County, and a corrected sand measurement gives 3,572-75 feet as the pay depth. The hole filled up 3,000 feet with oil which has a corrected gravity of 32.5 degrees A.P.I. The most recent expression regarding the formation which carried the oil is, that it is slightly above the Gorham pay which has made some good wells north and east of the Schultz well. The general opinion is that it is about 30 or 40 feet above the Gorham pay, and there is much optimism regarding the possibilities of establishing production in this well when the real Gorham pay is touched. Phillips Petroleum Co. has a large block of about 8,000 acres around the well, with almost no free acreage close to the location.

On a swabbing test the Phillips well swabbed 12 bbls. an hour for several hours. It is estimated good for 250 bbls. at the present depth.

Butler County

Empire Oil & Refining Co.'s No. 2-A Brandenberger, NW cor. SE NE, Section 22-27-5, made 175 bbls. from sand at 2,709-48 feet. No. 4 Willets, SE cor. NW, Section 27-27-5, has been completed for 200 bbls. in sand at 2,734-57 feet.

Cowley County

Tidal Oil Co. and Skelly Oil Co.'s No. 2 Wallace, SE cor. SW, Section 15-32-4, is dry and abandoned at 2,982 feet. W. M. McKnabb's No. 1 Wallace, NE cor. NW, Section 22-32-4, has been completed for 20 bbls. in sand at 2,941-88 feet. Foster & Deal's No. 1 Bennett, C of Lot 1, Block 47, Winfield Townsite, Section 22-32-4, made 15 bbls. oil from lime at 2,971-73 feet. Grubb & Cobb's No. 1 Balles, NW cor. SE, Section 34-34-7, is dry and abandoned at 2,934 feet. The Prairie Oil & Gas Co.'s No. 1 Shane, SW cor. NW, Section 13-33-3, has been abandoned at 3,775 feet.

Chautauqua County

The Prairie Oil & Gas Co. made location for No. 1 Looby, NE SE NE, Section 17-34-12.

Elk County

Mann and others' No. 1 Shrader, SW cor. Section 12-31-8, has been completed for 14,000,000 feet of gas in sand at 1,505-15 feet.

Greenwood County

The Prairie Oil & Gas Co. made location for No. 3 Gaffney, NE cor. NW SE, Section 7-24-11. Skelly Oil Co.'s No. 1 Pixlee, NE cor. SE SW, Section 3-22-10, is dry and abandoned at 2,425 feet. Lewis Producing Co.'s No. 1 Gruber, NW cor. SW, Section 33-22-13, has been abandoned at 1,861 feet. Brossius and others' No. 1 Hendrickson, SE cor. NE SW, Section 18-25-9, is dry and abandoned at 2,337 feet.

Morris County

General Utilities Co.'s No. 1 Pape, NE cor. Section 15-16-7, has been completed for 3,000,000 feet of gas in sand at 1,436-38 feet.

McPherson County

Merriman, Shidell and others made location for No. 1 Hawkinson, NW cor. NE SE, Section 32-18-2w. Gardner Petroleum Co. is erecting the rig for No. 2 Benson, NE cor. SW, Section 32-18-2w. Mid-Kansas Oil & Gas Co.'s No. 1 John-

(Continued on Page 119)

KANSAS WILDCATS

BARBER COUNTY

Barbara Oil Co.'s No. 1 Blunk, C NE NW Sec. 20-34-13w..Shut down 4,715 ft.
Rolland et al's No. 1 Pickens, NE cor. NW NE Sec. 27-30-14w ..... Drlg. 4,100 ft.
Skelly Oil Co. et al's No. 1 Winter, C E half Sec. 17-31-12w ..... Dry and abandoned 4,530 ft.

BARTON COUNTY

Everett & Wiley's No. 1 Ward, NW cor. SW Sec. 12-20-13w ..... Shut down 3,948 ft.
McJilton et al's No. 1 Evanston, SE cor. NW Sec. 24-17-11w ..... Rig.
Mid-West Exploration Co.'s No. 1 Karst, SW cor. SW Sec. 11-16-15w ..... Drlg. 2,150 ft.

BUTLER COUNTY

O. H. Fleming et al's No. 1 Brainard, NE cor. NW Sec. 22-24-3 ..... Drlg. 3,145 ft.
LaRobb et al's No. 1 Bronsenger, NE cor. SW Sec. 24-27-3 ..... Rig.
Swartz et al's No. 2 Randall, NW cor. NE NW Sec. 22-24-4 ..... Drlg. 1,550 ft.

CHASE COUNTY

Griener & Fowler's No. 1 Carson, NE cor. NE Sec. 9-21-7 ..... Shut down 3,162 ft.

COWLEY COUNTY

Jones & Hall's No. 1 Shapland, NE cor. NW SE Sec. 20-30-6 ..... Drlg. 3,054 ft.
Roth & Faurot's No. 1 Ridding, SE cor. NW Sec. 31-32-6 ..... Drlg. 2,160 ft.
Roxana Pet. Corp.'s No. 1 Galley, NE cor. NW SW Sec. 18-35-3 ..... Drlg. 2,190 ft.
Pyle & Sutter's No. 1 Lindstrom, SW cor. NE Sec. 9-35-4 ..... Fishing 900 ft.
Prairie Oil & Gas Co.'s No. 1 Shane, SE cor. NW Sec. 13-33-3 ..... Dry and abandoned 3,775 ft.
Empire-Marland-Twin States' No. 1 Feaster, NW cor. NE Sec. 36-32-5 ..... Drlg. 1,650 ft.
E. B. Shawver's No. 1 Cook, NE cor. NE Sec. 20-30-6..... Drlg. 2,860 ft.
Crow & White's No. 1 Powers, C NW NE Sec. 9-32-5..... Sand 714-734 ft., 1,000,000 ft. gas
Slick & Martin's No. 1 Aspaugh, SW cor. NE Sec. 27-31-5 ..... Drlg. 3,140 ft.
J. B. Markey's No. 1 Tatum, SE cor. SW Sec. 11-31-6..... Shut down 500 ft.
Jones & Hall's No. 1 Shapland, SE cor. NW SE Sec. 20-30-6 ..... Shut down 3,396 ft.

DICKINSON COUNTY

Empire G. & F. Co.'s No. 1 Duffy, NE cor. SW SE, Sec. 3-12-3 ..... Dry and abandoned 2,982 ft.

ELLIS COUNTY

Rush Oil Co.'s No. 1 Gatewood, NW cor. NW Sec. 4-15-20w ..... Shut down 1,100 ft.
Transcontinental Oil Co.'s No. 1 Boetcher, NW cor. SE SW Sec. 21-13-19w ..... Drlg. 3,145 ft.
Finney & Weiner's No. 1 Freeman, SE cor. SW Sec. 24-15-20w ..... Rig.
Labette Oil Co.'s No. 1 Urban, NE cor. NW NW Sec. 19-15-16w ..... Drlg. 2,150 ft.
James A. Brouk et al's No. 1 Gorham estate, C SE SE Sec. 35-15-16w ..... Running casing 2,044 ft.
Derby Oil Co.-Empire Oil & Ref. Co.'s No. 1 Krause NW cor. SW SW Sec. 17-14-19w ..... Shut down 3,100 ft.
Phillips Pet. Co.'s No. 1 Brull, C NW Sec. 34-14-17w .... Spudded.
Moncrief et al's No. 1 Johnson, SW cor. NE Sec. 9-13-19w ..... Rig.
John Brown's No. 1 Gestner, SE cor. SW NE Sec. 13-13-16w ..... Spudded and shut down.
Empire Oil & Ref. Co.'s No. 1 Wann, NE cor. NE Sec. 31-13-19w ..... Drlg. 2,720 ft.
Mid-West Exploration Co.'s No. 36 Furthmer, SE cor. SE Sec. 25-12-16w ..... Drlg. 825 ft.
Phillips Pet. Co.'s No. 1 Shultz, C NE Sec. 5-12-17w ..... Lime 3,573-75 ft., 2,000 ft. oil.

(Continued on Page 114)

Ohio Gets Good Well at Champagnolle

Producer Located in Old Shallow Sand Section of Field. Deals for Crude Oil Production Attract Interest

By D. H. Bancroft
Staff Correspondent, Louisiana-Arkansas

SHREVEPORT, La., Nov. 19. — A tendency on the part of small operators to sell out and on the part of larger interests to absorb smaller producing properties was emphasized during the past week when E. M. Jones sold out his Smackover interests to Lion Oil Refining Co. for a reported $350 per barrel. The property consists of six leases aggregating approximately 160 acres with a daily production of 600 bbls. H. L. Hunt, Inc., also has been busy buying and now has approximately 50,000 bbls. production in Urania Pool in LaSalle Parish, Louisiana, and is buying in Smackover and El Dorado. Magna Production Co. also is buying producing acreage in Smackover, having taken over 50 acres in that area with 150 bbls. daily production. Prices at which this production has been bought have not been revealed, nor is it determined whether the buyers are buying on their own account. There is an impression in some quarters that big interests who do not desire their activities to be known at this time are the real buyers.

These transfers were the news of the week. Otherwise most of the developments were of a routine nature except for Champagnolle's eastern extension. In this area Ohio Oil Co.'s No. 9 Crain in Section 1-17-14 was the big well of the week and, being in the oldest part of the field and producing from the original shallow sand, makes that end of Champagnolle and that horizon look like the best part of the field after all. Completed November 13, it started flowing 400 bbls. from 7 feet of sand, total depth 3,014 feet, and its value and significance will be understood when it is remembered that this section and the dozen or more wells in it have been producing for over a year and that the discovery well was not much better. Furthermore, a well in the same section started at around 400 bbls. natural and is still flowing a little more than 285 bbls.

Extends Production

The Ohio Oil Co. also accomplished something with No. 1 Ward in the NW cor. NW SW Section 14-17-14 which, making 10,000,000 feet of gas with 50 to 75 bbls. of oil from 7 feet of sand, total depth 3,020 feet, extended production about a half-mile southeast. Furthermore, it is a shallow sand well in the extreme southeast corner of what has heretofore been regarded as strictly deep sand—3,200-foot territory. Over in the diagonal corner of the deep sand area Rovenger corporation completed No. 4-A Pardue in the NE cor. NE NW Section 10-17-14 pumping 300 bbls. from 3,052 feet, but 98 per cent of the yield was salt water. It had been standing for over a month.

E. M. Jones' No. 1 Sample in Section 7-17-13, which showed for 40,000,000 feet of gas at 3,196 feet last week and was expected to be a completion this week did not drill cement plug from 6⅝-inch casing cemented at 3,145 feet as anticipated but is expected to be a completion before the next report is issued. So also is Lion Oil Refining Co.'s No. 4 Union Sawmill in the NW cor. NW NE Section 7-17-13, which while standing 500 feet in oil from 11 feet of sand, total depth 3,089 feet, pulled liner to take another core. Magnolia Petroleum Co.'s No. 1 Dumas, Section 11-17-14, a mile northeast of the Ohio's Ward well gave signs of duplicating the latter's performance. It showed for 2,000,000 feet of gas on drill stem test at 3,220-26 feet and cemented 6⅝-inch for a test in the deep sand. The Ohio's well is in the shallow stuff. The Ohio Oil Co. has had better luck in the eastern extension than it has in the deep sand area and is starting another well, No. 1 Alphin, in the SE cor. NW NW Section 7-17-13. Following Skelly Oil Co.'s location for No. 1 Kelly in the C SW NE SE Section 9-17-14, Oilwell Corp. has derrick up for No. 2-A Kelly in the NW cor. NE SW SE of the same section. This particular locality appears to be a gas lens of the Champagnolle Field where other completions at the same level father east, southeast and northeast, have been producers.

Failure of other experiments in wildcat territory outside of Union and Ouachita Counties has not, apparently, discouraged Ohio Oil Co. or others. Geophysical work is still going on to a considerable degree and one new wildcat has been started and Ohio is to start another. The one already under way is J. B. Hurley's No. 1 Arkansas Timber Co. in Section 29-16-12, Calhoun County, and Ohio has made location in Section 19-16-9, Bradley County. This is on a block of 3,500 acres taken over from Hurley in addition to which the company has 7,000 acres in the south half of Township 15, Range 9.

Northwest Louisiana

Interest in northwest Louisiana activities centers chiefly, at present, in Dixie Oil Co.'s No. 92 Dillon, Section 13-21-15, Pine Island, and Magnolia Petroleum Co.'s No. 3 Levee Board, Section 7-20-15, Oil City, districts of Caddo Parish. Dixie is having considerable trouble cleaning out the hole to set 4½-inch to test a show of gas at 6,099 feet which, despite a bridge from around 2,600 feet to the bottom managed to rock up 2,400 pounds over night. The hole is heaving and caving almost as fast as it can be cleaned out. Magnolia Petroleum Co.'s well was due for completion before this is read. After it had filled up 1,100 feet in oil with 100 feet of salt water from 17 feet of what is believed to be a stray sand—in as much as no sand has been found at this level elsewhere in Caddo and the location is in a "barren" area surrounded by failures with one or two producers—8⅛-inch casing was cemented at 3,004 feet (total depth 3,025 feet) and plug was drilled Saturday.

There was a fairly good crop of completions for an area that has long since gone to settled production and is productive of little of more than passing interest. Shreveport Oil Corp.'s No. 1 Hutchinson in Section 32-21-15, Caddo Parish, made a 100-bbl. pumper from 2,221 feet. The Monroe Gas Field had three small gassers. Natural Gas Producing Co.'s No. 12 Tensas in Section 15-22-4, Morehouse Parish, gauged 5,000,000 feet from 2,216 feet and in Ouachita Parish Moody-Seagraves' No. 1 Phillips, Section 20-19-4, gauged 3,000,000 feet, total depth 2,192 feet; and Stoval Drilling Co.'s No. 1 Lieber in Section 4-18-4 tested 3,500,000 feet, total depth 2,208 feet.

The Richland Parish gas field now has three craters wasting approximately 250,000,000 feet per day of gas which sells, at the wells, for an average of 4 cents per thousand—and neither operating talent nor expert advice from the State Conservation Department or other outside agencies has been able to kill any of the three. The last of the trio is Ouachita Natural Gas Co.'s No. 2 Pardue in Section 6-15-6, which blew out with gas and water from the shallow fresh water sand at around 400 feet into which gas had seeped from W. C. Feazell's No. 1 Pardue in the same section which cratered six weeks ago after having been shut in for some time. Six or 7 miles southeast of this area, Community Oil & Gas Co. completed No. 1 Boughton in Section 33-16-6, gauging 12,000,000 feet at 1,100 pounds from a total depth of 2,450 feet.

Magnolia Petroleum Co., after many trials at making a well of No. 5 E. W. Vox in Section 15-21-10, Cotton Valley district of Webster Parish, gave up and abandoned the hole as a salt water test. Drilled to 4,800 feet after passing up an oil and gas show, it was cemented back to around 4,690 feet and repeated. A shot failed to improve results.

Arkansas Natural Gas Co. completed its present series of wells in the Johnson County, Arkansas, Field at Clarksville with No. 1 Houston in Section 15-10-24 which tested 1,500,000 feet of gas at 690 pounds from the second sand at 2,440 feet. No further wells are contemplated in the immediate future, at least until the Clarksville-Little Rock 10-inch line, now nearing completion, begins pulling on the four that have been completed during the past month and the three completed before them during the past two years.

East Texas Gas Fields

The third gas blowout from lower horizons in the East Texas gas fields during as many weeks occurred when Magnolia Petroleum Co.'s No. 2 Steele in the B. C. Jordan Survey, Panola County, came in unexpectedly with an estimated 25,000,000 feet of gas from 3,259 feet—quite the deepest show that this area has exhibited. Casing will be set for a completion. Natural Gas Producing Co.'s No. 5 Roquemore, in the B. C. Jordan Survey, was completed gauging 2,000,000 feet of gas, total depth 2,270 feet, and No. 7 gauged 5,000,000 feet from 2,260 feet. C. F. Steele abandoned No. 1 D. R. C. Jernigan in the Jane Thorpe Survey as a dry hole at 2,490 feet and The Texas Company's No. 6-A Adams was a 2,200,000-foot producer at 983 feet.

Humble Oil & Refining Co.'s No. 7-B Grobes, Section 1-14-21, Nevada County, pumped 80 bbls. initial from 1,125 feet. J. E. Crosbie and others' No. 1 Primm, in Section 23-15-16, Smackover district of Union County, Arkansas pumped an initial 70 bbls. from the shallow Louann light oil sand at 2,019 feet. Rice and others abandoned No. 1-A Heinman & Myers in Section 23-16-16 before they got to the sand.

Daily average runs from the field had a small decline during the week, the division's 122,135 bbls. being 460 under last week's average. The decline would have been greater save for an increase of 1,030 bbls. from Champagnolle due to the series of good wells that have been completed there during the last two weeks. Declines in all other Arkansas pools and most of north Louisiana's fields wiped out this advantage, however, Louisiana pools showing a decline of 660

(Continued on Page 117)

NEW OPERATIONS COMPENSATE FOR TWO WILDCAT TESTS THAT FAILED

By D. H. Bancroft

SHREVEPORT, La., Nov. 19.—Dust settled this week upon the crown blocks of two widely separated wildcats drilled as deep tests in this division, but to offset this loss of activity, two more were begun and a third that has been shut down for several weeks resumed drilling. The first of the present crop of deep holes in western Union County, Arkansas—that is, deep for that locality—was abandoned when the Garrett-Modissette Drilling Co., drilling for Reid Clark and others completed its contract on No. 1 Murphy Land Co. in Section 30-17-17, and called it a dry hole at 3,515 feet. It had tested dry a week before at 3,090-95 feet. Location is in that part of Union County where considerable prospecting had been done by the Trinity Oil Co. and other corporate and individual wildcatters before, and which led to the discovery well in the El Dorado Field. Few of these wells, however, had gone much below 3,000 feet.

The next disappointment was Gulf Refining Co.'s No. 1 Attaway in Section 1-18-15, Caddo Parish, a rank wildcat located on a machine "high" about 10 miles northwest of Shreveport, near Blanchard. No showings of consequence were obtained anywhere along the log and it was abandoned late in the week as a dry hole at 4,564 feet with the bottom 650 feet in lime and shale. The Morgan Oil Co. abandoned No. 1 Smith in Section 26-19-11 on the southeastern flank of the Bellevue Dome after drilling to 1,865 feet in an attempt to get deeper production. The two tests made revealed dust at 1,044 feet and salt water at 1,150-52 feet.

Two New Operations

The two new operations are J. B. Hurley and others' No. 1 Arkansas Timber Land in Section 29-16-12, Calhoun County, Arkansas, 6 miles east of Champagnolle, on which rig is up for a deep test, and E. A. Martin, trustee's, No. 4 Dale in Section 23-15-26, Miller County, 15 miles east of Texarkana. Three other tests have been drilled in the immediate vicinity, both shallow and deep holes in the latter of which there was reported to have been more or less of an oil show, but the test developed only water. Nos. 1, 2 and 3 Dale were drilled by Lenz and others.

In Union County, the old El Dorado South Field area, Calgo Oil Co. has gone back to No. 1 Primm in Section 25-18-15, abandoned as a dry hole at 3,105 feet, and is making a deep test of it, drilling at last report at 3,265 feet. In Sabine Parish, Louisiana, The Texas Company, which shut down No. 1 Hamlin in Section 28-10-13 to months ago at 3,760 feet, has resumed operations and is drilling at 3,830 feet. Location is about 6 miles east of production in Pleasant Hill district and the only show reported was an estimated 132,000 feet of gas on a drill stem test at 3,682 feet.

The Gulf Refining Co. elected not to make a well of its No. 1 Pickering on the P. W. Hardey lease in Shelby County, Texas, which gauged approximately 5,000,000 feet of gas from 5 feet of sandy lime at 3,345 feet, but went on and is drilling a hard gray lime at around 3,315 feet.

Chapparall Has Fishing Job

In the same county, but farther west, the Chapparall Oil Co., which has had a fishing job at 1,650 feet, got the bit out and is drilling again in broken lime at 1,807 feet.

Territory along the Panola-Harrison Counties line between the Waskom and Panola County (Bethany) gas fields, is reported to be in line for a series of wells in both counties. The Watterman Lumber Co. of Loraine (Waskom) recently sold 16,000 acres of its holdings

(Continued on Page 116)

D+B *Simplex*

STUFFING BOX

NOTHING could be simpler or more easily adjusted than this D+B Simplex Stuffing Box. For a change of pressure it can be tightened or loosened without the use of a wrench. The two handles...which hang down out of the way when not in use ...are attached in such a way that they cannot work loose or become lost. Has a minimum number of parts and consequently cannot get out of order. Uses any standard packing.

Write for Bulletin No. 2 of Pumping Equipment

D&B DIVISION

EMSCO DERRICK & EQUIPMENT COMPANY
LOS ANGELES, CALIF., HOUSTON, TEXAS-DALLAS, TEXAS
U. S. A.
EXPORT OFFICE: 120 BROADWAY
NEW YORK CITY, N. Y.
U. S. A.

EMSCO STEEL EQUIPPED WELLS ARE SAFE . . . .

Operators Active at South Liberty

Development of Shallow Sand in Coastal Pool Proceeding Rapidly. Good Wells Completed at East Hackberry and Lockport, La.

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Nov. 19.—Although the early part of the week in the Gulf Coast was marked by the completion in quick succession of prolific producers in three wildcat fields, the rapid development of the new shallow sand area of the South Liberty Dome was holding the attention of operators over the week end.

The continued holding up of the discovery well, Sun Oil Co.'s No. 10 Mitchell, now making around 1,300 bbls., and the bringing in of its direct west offset, Gulf Production Co.'s No. 1 Chambers, flowing 1,000 bbls. daily, increased the interest in the possibilities of that pool and started a competitive drilling campaign with three of the major companies participating.

While these shallow wells can be drilled and completed within four or five days, the status of the South Liberty shallow field Sunday was two producers making between 2,000 and 2,500 bbls.; three other offsets either testing or cemented on the sand; six tests drilling or rigged up, and five locations. The three companies in the pool are Sun Oil Co., Gulf Production Co., and The Texas Company. The Sun Oil Co. and Gulf Production Co. are offsetting each other east and west moving northward along the dividing line of their respective Mitchell and Chambers tracts, while The Texas Company is offsetting both to the south on its Staiti lease.

Offset Is Good Well

Gulf Production Co.'s No. 1 Chambers, the direct west offset to Sun Oil Co.'s No. 10 Mitchell, the discovery well, was brought in Friday good for 1,000 bbls. daily from the sand at a total depth of 827 feet. This is somewhat shallower than the discovery well which is producing from a total depth of 875 feet. The Texas Company's No. 13 Staiti, direct south offset of the discovery well, topped the sand and cemented 6⅝-inch casing at 785 feet with the bottom of the hole at 815 feet. Sun Oil Co.'s No. 12 Mitchell, 150 feet east of No. 10, is in the sand at 931-42 feet, and No. 13 Mitchell, 150 feet north of No. 10, is in the sand at 805-818 feet.

As the drilling has spread out so far only one location east and west of the discovery well, The Texas Company has only three rigs there and has only one location to make, but the Sun Oil Co. and Gulf Production Co. are moving in every available crew for the string of tests being drilled northward.

In the new Gay Hill district of Washington County, Sun Oil Co.'s No. 2 Grote, which came in last Monday with an initial flow estimated at 4,400 bbls. daily, has been shut in all week pending the completion of storage and a 6-mile line to the town of Gay Hill, where loading racks will be built. This well is considered as one of the most important developments on the coast, as indication of a prolific field in that district, but as the Sun Oil Co. has a solid block of around 7,500 acres the field will be drilled conservatively.

The No. 2 Grote, which is producing from 387 feet of sandy shale with the pay at 1,346 feet, not including the 46 feet of rat hole to the bottom of the hole at 1,392 feet. This is believed to be a record length of screen on the coast. The oil tested 28 gravity at 84 degrees. This well is 688 feet to the northwest of the No. 1 Grote, the discovery well, which has been producing around 50 bbls. from a total depth of 1,154 feet. With the completion of the No. 2 Grote as such a prolific producer, the No. 1 Grote is to be deepened in expectation of boosting its production to equal that of the No. 2.

East Hackberry Dome

Louisiana Land & Exploration Co.'s No. 3-B Calcasieu Lake, which blew in last Monday night extending production at East Hackberry Dome, Cameron Parish, Louisiana, 3,000 feet east and into the lake, has proved out so far to be the best well completed at East Hackberry. From a sandy shale at a total depth of 3,941 feet it blew in making initially an estimated 600 bbls. with a large volume of gas daily. After being brought under control, production steadily increased and Saturday the well was flowing 2,200 bbls. of pipe line oil through a five-eighths inch choke. Pressure of the well is 350 pounds and the oil tests 22.3 gravity.

This well is approximately a quarter mile out into Calcasieu Lake and as the Louisiana Land & Exploration Co. owns the rights in the lake leased from the State, no additional drilling will be required as a result of this well. The acreage to the water line is held by the Calcasieu Oil Co., Magnolia Petroleum Co. and Union Sulphur Co. jointly, which companies have been the principal developers of the East Hackberry Field.

The wildcat east flank of the Boling Dome on the Wharton and Fort Bend County line again figured in Gulf Coast developments the past week when the Gulf Production Co. deepened its No. 4 Bay from 3,815 feet to 3,898 feet and got a well flowing initially at the rate of 2,000 bbls. daily through a one-half inch choke.

This well, one of the five wildcat producers on the east side, originally was completed last September at 3,761-3,815 feet, spraying an estimated 50 bbls. It offset the east side discovery well, Hyde Production Co.'s No. 1 Fotjeck, which made a 200-bbl. well. The Gulf well, which Saturday continued to flow at the rate of about 1,500 bbls. daily, is by far the best well of the five so far completed.

Producer at Lockport

Lockport, Calcasieu Parish, Louisiana, Saturday broke the spell of bad luck which has hung over it for several months and got a 1,000-bbl. well in Vacuum Oil Co.-Gulf Refining Co.'s No. 2-A fee. The well is flowing through a one-half inch choke from a sand at 3,784 feet.

Other completions during the week included Yount Lee Oil Co.'s No. 84 McFaddin, Spindletop, flowing an estimated 1,300 bbls. of 24 gravity oil daily through tubing and a choke, sand 3,151 feet; The Texas Company's No. 33 Koehler, Humble, an old well deepened to 3,211 feet, flowing 100 bbls. net oil, 50 per cent sediment and water; Republic Production Co.'s No. 85 Dolbear, Hull, deepened to 2,098 feet, flowing 2,000 bbls. 36 gravity oil; South Texas Petroleum Co.'s No. 2 Gabe Lee, Blue Ridge, deepened to 4,021 feet, flowing 700 bbls. pipe line oil; Gulf Production Co.'s No. 49 Davis, Big Creek, pumping 200 bbls. daily, 3,775 feet; Gulf Refining Co.'s No. 11 Lutcher-Moore, Starks, flowing 360 bbls., 4,181 feet. Wright Brothers' No. 7-A Drushel, Edna gas field, Jackson County, 12,000,000 feet of gas at 750 pounds pressure, 3,198-3,202 feet.

In addition to the completions, Shell Petroleum Corp.'s No. 1 Random, Allen Dome, came back in unexpectedly while being rigged up to work over, and flowed initially 87 bbls. daily through a quarter-inch choke.

Abandonments during the week were: Navarro Oil Co.'s No. 2 Hausler, Big Creek, heaving shale, 3,746 feet. Vacuum Oil Co.-Gulf Refining Co.'s No. 6 Lock-Moore, Lockport, dry at 6,250 feet; Yount Lee Oil Co.'s No. 5 Housierre-Latrielle, Evangeline, cap rock, 4,850 feet; Gulf Refining Co.'s No. 1 Housierre-Latrielle, Egan, Acadia Parish, dry at 5,800 feet; Gulf Refining Co.'s No. 2 Kling, Loreauville, 2,415 feet; Big Dome Interest's No. 1 Finley, Liberty County, dry at 4,334 feet.

Daily average production of coastal fields dropped off 3,371 bbls. during the week to 131,674 bbls., this being largely due to the sanding up of Bennett Petroleum Co.'s Smith well at Barbers Hill and to smaller declines in other scattered fields. Figures for the coast, together with those of southwest Texas, are:

Texas

Allen Dome	6
Barbers Hill	670
Batson	1,345
Big Creek	2,681
Blue Ridge	5,736
Brenham	150
Boling	2,152
Damon Mound	700
DeWalt	4,033
Fannette	21
*Gay Hill	.....
Goose Creek	6,864
High Island	753
Hull	11,774
Humble	3,122
Markham	300
Nash Dome	875
North Dayton	690
Orange	3,832
Orchard	88
Pierce Junction	9,120
Raccoon Bend	708
Saratoga	975
Sour Lake	2,976
South Liberty and Dayton	4,915
Spindletop	38,954
West Columbia	7,738
Total this week	111,178
Total last week	115,079
Decrease	3,901

*Shut in.

South Louisiana

Anse La Butte	46
Atchafalaya	850
East Hackberry	4,775
Edgerly	785
Evangeline	999
Lockport	3,446
Loreauville	5
Sorrento	579
Starks	812
Sulphur	2,000
Sweet Lake	1,875
Vinton	4,289
Welsh	35
Total this week	20,496
Total last week	19,966
Increase	530
Total Gulf Coast	131,674
Total last week	135,045
Decrease	3,371

Southwest Texas

Dale	783
Kingsville	319
Luling	13,355
Lytton Springs	1,185
Refugio	400
Somerset	1,985
Mirando district	13,343
Total this week	31,370
Total last week	29,020
Increase	2,350

Raccoon Bend—Austin County

Humble Oil & Refining Co.-Valley Oil Co.'s No. 2 Urban continues to blow wild after a blow out at 2,327 feet over a week ago. These operators' No. 1-B Grawunder is drilling shale at 3,011 feet. No. 1-C A. Grawunder has set 13⅜-inch surface casing at 1,336 feet. No. 1-B Bracey is drilling lime and shale at 2,109 feet. No. 2 Walton is drilling sticky shale at 873 feet; No. 2 Beal, shale and lime at 1,974 feet, and No. 1 Hardy, hard sand at 759 feet.

DeWalt—Fort Bend County

Humble Oil & Refining Co. has start-

(Continued on Page 119)

SECOND LARGEST PRODUCING WELL COMPLETED IN TURNER VALLEY

By Victor Lauriston
Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Nov. 17.—In the Turner Valley Field southwest of Calgary, Okalta Oils' No. 1, LSD 1, Section 1-20-3w5, got production at 5,015 feet, approximately 95 feet in the deep lime, with a gas flow estimated at 15,000,000 to 20,000,000 feet a day and a potential crude naphtha or light crude recovery of 400 bbls. a day. Definite tests have not yet been made; the production will test over 60 degrees, but it is mixed to some extent with the oil forced through the drill stem to hold down the gas pressure. At last reports the test was being drilled deeper. Approximately 100 bbls. production was secured when the drill first entered the lime. The sudden increase in pressure when the big wet gas flow was struck flowed the oil through the 6-inch discharge pipe. It ignited, but the fire was later extinguished, and production diverted to storage tanks. The company has about 1,750 bbls. of storage, with a line to deliver the production to the Royalite Oil Co. Okalta's No. 1 is now the second largest producing well in the field. It holds a position on the structure similar to McLeod Oil Co.'s No. 2, which got a big wet gas flow with around 500 bbls. crude naphtha recovery in a similar formation, but later lost most of its production when drilling solution choked the hole.

Royalite Oil Co.'s No. 17, LSD 13, Section 6-20-2w5, got a wet gas flow, estimated 5,000,000 feet a day, at 3,586 feet. This is some 120 feet in the deep lime. Drilling is being continued for big production; the well at this depth has a potential crude naphtha recovery around 75 bbls. a day. Royalite's No. 12, LSD 3, Section 13-20-3w5, is at 2,781 feet and running 10-inch casing. Royalite's No. 13, LSD 6, Section 13-20-3w5, is drilling at 4,246 feet. Royalite's No. 14, LSD 4, Section 7-20-2w5, is in the top of the lime at 3,248 feet and fishing for drill rods stuck in the hole. Royalite's No. 16, LSD 2, Section 12-20-3w5, is at 3,543 feet and drilling. Royalite's No. 18, LSD 15, Section 12-20-3w5, is drilling at 2,927 feet. Royalite's No. 19, LSD 5, Section 6-20-2w5, is drilling at 2,634 feet. Royalite's No. 20 is drilling at 1,265 feet. Royalite's No. 22, Section 13-20-3w5, is drilling at 2,250 feet.

Foothills Oil & Gas Co.'s No. 2, LSD 8, Section 1-20-3w5, has resumed drilling after cementing 10-inch casing at 3,366 feet. Home Oil Co.'s No. 1, LSD 10, Section 20-19-2w5, which cemented in top of the deep lime at 5,108 feet, has started to drill into the lime. Home Oil Co.'s No. 3, LSD 14, same section, is drilling out cement at 3,760 feet. Northwest Associated's No. 1, LSD 6, same section, is drilling at 1,594 feet.

Spooner Oils No. 1, LSD 12, Section 13-20-3w5, is making a definite production between 65 and 70 bbls. a day from the deep lime at 5,260 feet. Spooner's No. 2, Section 24-20-3w5, is in the lower Fernie shales at 4,930 feet and running 6-inch casing to the bottom. Casing will be carried down behind the tools, which are expected to get the deep lime at

(Continued on Page 118)

Joe Bruner Field Presents a Puzzle

Chalk High and Edwards Lime Low in Some Wells Create a Situation That Makes One Geologist Look as Good as Another

By B. D. Stevenson
Staff Correspondent, Southwest Texas Fields

SAN ANTONIO, Tex., Nov. 19.—Chalk high and Edwards lime low in some wells in the Joe Bruner Field in Caldwell County is presenting a puzzling situation. Sun Oil Co.'s No. 2 R. W. Malone, a northwest offset to its discovery Edwards lime well and only 300 feet away, seemed to have the Edwards about 20 feet lower than the discovery well. Carl Brothers and Suttle's No. 1 Cora Malone and the Ratcliff and others' No. 1 Cora Malone, each with a high chalk, were at 2,694 feet each late last week and in the Georgetown, indicating that the Edwards must of necessity be a little low. They were going to stop where they were and put the wells on production.

These wells were in the south end of the field. It is nearly a case where most anyone is a good geologist in the Joe Bruner Field, owing to these irregular features. Abercrombie got the top of the Edwards lime at 2,713 feet compared with 2,712 feet in the Sun's No. 1 Malone and it is approximately 3,000 feet northeast of the Sun well.

Since the last report published by The Oil and Gas Journal one well in the Edwards lime has been brought in, making a total of four. For the past two weeks or more up to the bringing in of this well, the M. K. Towns No. 1 Hickman, no Edwards lime wells were completed. Towns' No. 1 Hickman flowed about 400 to 500 bbls. through the 6⅝-inch casing and was to run tubing as soon as the tubing could be obtained. A half dozen or more wells are due to be completed within a few days and with the completion of these the first real lineup of the field will be available.

More to Be Known Soon

Twenty-eight rigs were running at the end of last week which is a guarantee that in a little while a lot more will be known as to the size and importance of the field. Since the Sun drilled in its No. 1 Malone a month ago only two other wells, Golden West Oil Co.'s No. 2 Wilson, an offset, and Lutex Oil, Inc.'s, No. 2 Wilson, about 750 feet southwest, were carried to the Edwards until Towns brought in his No. 1 Hickman last week. The Hickman well is over a mile to the northeast which gives an important extension to the producing area. Now with other wells, some of them scattered about, due to come in this week and 20 others scheduled to hit the pay in a period of 10 days the field will begin to shape up.

The production seems pretty good from the first wells completed—around 500 bbls. or better a day initial—but there is not much gas and the probability is, estimating on the performance of the first wells, that they will go to the pump almost immediately.

Lutex Oil, Inc., which deepened its No. 2 Wilson to the Edwards and went on through the first and second cap into water, has not yet plugged back. Golden West drilled its No. 2 Wilson, offsetting Sun, through the first cap in the Edwards to a total of 2,719 feet. An old engine gave some trouble, but it reduced the water, and a new engine with a long and faster stroke has reduced the water so much that the company is not going to plug back at this time but will keep the well on production as it is.

The feature of the field at this time is the large number of new rigs. Eight new locations were made last week. All told the drilling activity stretches now over a territory about 3 miles in length and a half mile wide. Roxana last week made three new locations and is rigging up on each and Gulf made one and is rigging up and Humble one. At the south end of the field Witherspoon & Lange are waiting on the outcome of some wells. Golden West is drilling in its No. 1 Cook and its No. 4 Wilson.

Refugio Field

Houston Oil Co.'s No. 4 Wilson-Heard and W. L. Pearson's No. 1 Mitchell, the first at the south end of the Refugio Field and the other at the north end failed to develop anything in production last week. The Houston Oil Co.'s No. 4 Wilson at 4,992 feet and in a sand for which much was hoped came in salt water. It is feared the cement job was poorly done. In that field as well as in the White Point Field it is difficult to get a good cement job, hence the salt water is not the final verdict on that sand. The W. L. Pearson No. 1 Mitchell at the north end of the field coring at 3,680 feet last week is down around 3,780 feet this week in shale that shows some oil but it is too deep to get the oil production found in the Texas Gas Co.'s No. 2 Holmes Heard at 3,701 feet. It is a half mile north of the No. 2 Holmes Heard. Houston Oil Co.'s No. 10 Rooke at the south end of the field and about a half mile west of the nearest production of any kind picked up a sand at 3,512 feet not reported in other wells and some little hopes were being entertained for it.

The Refugio Field is being worked from two ends and one side. The Houston Oil Co. and the Houston Gulf Gas Co. have the middle of the field and they have offset each other with gas wells in the early days of the field and each has many acres of undrilled inside locations and with no particular reason for drilling deeper at this time. At the north and south ends and on the west side acreage is in other hands and they are looking for production. George E. Smith and William F. Morgan are on the west side. Morgan is going back into his James Agnes Lambert No. 2, a dry hole at shallow depth and will drill it deeper. It is off beyond shallow production.

Laredo District

Various pools of the Mirando Field in the Laredo district increased 3,353 bbls. daily average in October over the September production as shown by the pipe line runs from the field. Total daily average for October was 13,775 bbls. and for September it was 10,442 bbls. Total production from the Albercas Pool for October averaged 6,067 bbls. daily or about half that from the field and from the Magnolia-Cole Pool the daily average was 2,208 compared with 2,021 bbls. daily in September. These two pools are a 1928 development and their total production shows what a big element they are in the Mirando district at this time, 8,275 bbls. daily coming from these two pools and 5,500 bbls. daily coming from the remainder of the field.

Wells at the south end of the Albercas Pool drilled by the Sun Oil Co. and the Magnolia Petroleum Co. were chiefly responsible for the increase in that pool which is located in the southeast corner of Webb County just north of the Henne, Winch & Fariss Pool in Jim Hogg County. Eight wells of the Sun Oil Co. at the south end of the pool, four of them completed during October averaged 3,181 bbls. daily and 10 wells of the Magnolia in that part of the field three of them completed during October, averaged 1,971 bbls. per day.

Two Albercas Completions

During the past week in the Mirando district two wells were completed in the Albercas Pool, one of them for 400 bbls. flowing and one for 300 bbls. One 125-bbl. well, flowing, was completed in the Cuellar Pool and one 15,000,000-foot gasser in the same pool. And in the Alworth Pool one 60-bbl. well. In the Albercas Pool, O. W. Killam's No. 26 Bruni came in flowing 400 bbls. of which 40 bbls. was water. It is an important extension to the northeast of about 800 feet. The other completion in that field was the Sun Oil Co.'s No. 7-A Yeager-Strohman in sand at 2,161-67 feet, flowing 300 bbls. of oil. It is an east offset to Rycade's No. 3 and these two are the farthest south in the field and both good wells, indicating further extension south.

In the new Cuellar Field in Zapata County, O. W. Killam completed the No. 6 Cuellar in sand at 1,459-63 feet, flowing 125 bbls. of oil—about the same size well as the discovery hole and some others completed since. But the Killam-Duggan No. 3 Cuellar in the same field with casing set at 1,438 feet and total depth 1,459 feet, came in a 15,000,000-foot gas well. Alworth-Stevens-Hild's No. 13 M. Garza in the Alworth Pool, 5 miles south of the Randado Pool in Jim Hogg County, in sand at 1,020-25 feet is a 60-bbl. well.

Usher Carson's No. 5-D Webster in the Carolina-Texas Field pumps about 120 bbls. of oil a day at 2,600 feet.

Sun Oil Co.'s No. 1 Henne-Winch in the Schoolfield-O-Byrne Pool in Duval County has run tubing and is flowing 240 bbls. of oil a day. It seems to be about the best well thus far completed.

COMPLETIONS

Bastrop County

Cranfill & Reynolds' No. 1 Andy Yost, A. Garcia Survey, completed at 1,598 feet in Serpentine topped at about 1,480 feet, is pumping 400 bbls. of oil.

Caldwell County

Golden West Oil Co.'s No. 2 Joseph Wilson, A. Floyd Survey, Bruner Field, completed at 2,717 feet making considerable water and which was to be plugged back, is now pumping 150 bbls. of oil daily, amount of water greatly reduced by new engine and longer stroke pump.

Lutex Oil, Inc.'s, No. 2 Wilson, A. Floyd Survey, Joe Bruner Field, at 2,719 feet has been plugged and is still making some water with the oil.

Jim Hogg County

Alworth-Stevens-Hild's No. 13 M. Garza, Survey 39, Block 9, Alworth Field, has been completed at 1,025 feet for 60 bbls.

Webb County

Sun Oil Co.'s No. 7-A Yeager-Strohman, Share 5, Albercas Field, completed at 2,167 feet, is making 300 bbls.

O. W. Killam's No. 26 Bruni, Block 64, Albercas Field, has been completed at 2,206 feet making 400 bbls., 10 per cent of which is salt water.

Zapata County

Killam-Duggan's No. 3 Cuellar, new Jennings, Field, Cerrito Blanco grant, at 1,459 feet blew in while coming out of the hole for 15,000,000 feet of gas.

O. W. Killam's No. 6 Cuellar, Jennings Field, Cerrito Blanco grant, has been completed at 1,463 feet flowing 125 bbls.

Nueces County

Houston Oil-Sun Oil Co.'s No. 1 Talbert, Survey 2, Block 5, Agua Dulce gas field, completed at 2,018 feet a good gas well with 825 pounds rock pressure.

ABANDONED TESTS

Bastrop County

A. A. Loomis has abandoned location made in the John W. Burton Survey.

John Storey's No. 1 Ed Pendergrass, J. B. Blalock Survey, is dry and abandoned at 1,831 feet.

Caldwell County

Lonnie Glasscock's No. 1 well, in Lytton Springs Townsite, is dry and aban[doned] at 2,050 feet.

Kleberg County

Humble Oil & Refining Co.'s No. 4-[B] Dennett, Section 38, Lot 19, Kingsvill[e] Field, at 2,645 feet swabbed salt wate[r] with rainbow showing of oil and is pull[ing] casing to abandon.

Nueces County

R. & G. Corp.'s No. 1 Bessie Ker[r] Section 36, Agua Dulce Pool, has tem[po]rarily abandoned location.

R. & G. Corp.'s No. 1 H. G. Yake[y] Section 37, Agua Dulce Field, has tem[po]rarily abandoned location for the test.

Alexander and others' No. 2 J. J. Eliff, location in the Agua Dulce Field has been abandoned.

San Patricio County

George B. Pickett's No. 1 J. E. Gar[rett], Block 23, is abandoned at 3,130 fe[et] with casing left in the hole.

Webb County

Callaghan Land & Pastorial Co.'s No. 3 Callaghan, Survey 440, is dry and abandoned at 865 feet.

Suladie and others have abandoned location for the No. 1 Neal in Survey 1,00[0]

Zapata County

Gleason Oil Co.'s No. 2 Benavide[s] Survey 11, Block 11, in Andrews Field is dry and abandoned at 1,748 feet.

Zavala County

Mirando Gas Co.'s (Witherspoon [O]il Co.) No. 3 I. West, Section 43, is dry and abandoned at 1,100 feet.

NEW LOCATIONS MADE

Bastrop County

Germany & Loomis' No. 1 Yost, A. Garcia Survey, is location 450 feet [s]outh and east lines.

Cranfill & Reynolds' No. 3 A. Yost, A. Garcia Survey No. 2, is rigging up 2[0] feet north of the discovery well, the No. 1 Yost.

Atascosa County

Witherspoon Oil Co.'s No. 4 Lu[cy] Nichols, Gray Survey No. 516, is at 2,167 feet.

Bexar County

H. J. Moore's No. 1 Holly R. Ellis[on] 14 miles west of San Antonio, is locate[d] 2,916 feet to east line and 1,500 feet [to] south line.

E. G. Potter's No. 1 Watson, B. Ma[r]tinez Survey, is location 500 feet to we[st] line and 2,000 feet to south line.

Caldwell County

Neumann & McIntire's No. 1 J. [W.] Patton, John R. Miller Survey, 150 fe[et] to north and west lines, is location [for] a mile east of Bute-Texas' No. 2 Bra[n]yon.

S. C. Wagley's No. 1 Gregg, A. Fl[ee]s Survey, Bruner Field, is location 1[50] feet to south and west lines.

Humble Oil & Refining Co.'s No. [1] Glass, P. Martinez Survey, is locate[d] 450 feet to north line and 150 feet [to] west line.

F. A. Gomillion's No. 1 Pearson, Martinez Survey, is location 900 fe[et] west of center of east line.

Roxana Petroleum Corp.'s No. 1 [W.] L. Smith, A. Floyd Survey, Brun[er] Field, is rigging up 150 feet to nor[th] and west lines.

Roxana Petroleum Corp.'s No. 2 [W.] L. Smith, A. Floyd Survey, Bruner Fie[ld] is rigging up 109 feet to south line a[nd] 487 feet to east line.

Roxana Petroleum Corp.'s No. 1 [W.] Smith, A. Floyd Survey, Bruner Fie[ld] has derrick up 150 feet to north and e[ast] lines.

Cranfill & Reynolds' No. 3 W. [A.] Smith, A. Floyd Survey, 150 feet to so[uth] and east lines, is drilling at 1,400 feet.

Cranfill & Reynolds' No. 1 Merriwea[th]er, A. Floyd Survey, 150 feet to nor[th] west and northeast lines, is rigging up.

Gulf Production Co.'s No. 1 J.

Davis, A. Floyd Survey, 150 feet from northwest and southwest lines, is rigging up.

Golden West Oil Co.'s No. 4 Wilson, A. Floyd Survey, 450 feet to northwest lines and 150 feet to northeast lines, is setting casing in the top of chalk.

Magnolia Petroleum Co.'s No. 5 R. Rios "A," Luling Field, is drilling at 550 feet.

Guadalupe County

Magnolia Petroleum Co.'s No. 2-B J. & J. M. McKean, H. Cottle Survey, Luling Field, is location 150 feet to north and southwest lines of J. M. Roberts tract.

Magnolia Petroleum Co.'s No. 24 L. Marines is location in the Luling Field.

Magnolia Petroleum Co.'s No. 1 C. H. Adams, J. Randolph Survey, 150 feet to southwest and southeast lines, is building derrick.

Goliad County

W. G. French's No. 1 J. E. Pettus, near Cabeza Creek, has derrick up and moving in rig.

Refugio County

William F. Morgan's No. 2 James Agnes Lambert, 250 feet to south line and 375 feet to east line of Tract 8, is moving in rig to deepen from 2,730 feet.

Houston Gulf Gas Co.'s No. 7 James Agnes Lambert, Refugio town tracts, 750 feet to east line of Lambert land and 2,000 feet to north line, is moving in to deepen from 2,700 feet.

Webb County

O. W. Killam's No. 28 Bruni, Block 64, Albercas Field, has been spudded in.

Rycade Oil Co.'s No. 4 Yeager-Strohman, Share 5, Albercas Field, 750 feet to north line and 150 feet to east line, has been spudded in.

Magnolia Petroleum Co.'s No. 14 Yeager-Strohman, Share 5, Albercas Field, 900 feet to the north line and 375 feet to the east line, is location.

Magnolia Petroleum Co.'s No. 15 Yeager-Strohman, Share 5, Albercas Field, 1,400 feet to north line and 575 feet to east line, is location.

Zapata County

O. W. Killam's No. 7 Cuellar, Jennings Field, Cerrito Blanco grant, 425 feet to northwest lines and 770 feet to southwest lines, has been spudded in.

Cole Gas Field—Duval

J. J. O'Hern's No. 1 Benavides, Survey 697, Block 6, located 150 feet to south and east lines, is moving on. O'Hern & Seacord's No. 7 Benavides, Survey 174, Block 11, located 540 feet to southeast lines and 535 feet to northeast lines, is moving on.

Humble-Reiter-Foster Pool

Humble Oil & Refining Co.-Reiter-Foster's No. 10 Kohler, Survey 166, located 165 feet to the east line and 1,605 feet to the south line, is at 300 feet preparing to set casing; No. 11 Kohler, Survey 395, located 1,155 feet to the north line and 165 feet to the west line, is rigging up.

Driscoll Gas Field

Robert Driscoll's No. 13 Driscoll, Survey 448, located 2,100 feet to the east line and 900 feet to the south line, is rigging up.

Schoolfield-O'Byrne Pool

Magnolia Petroleum Co.'s No. 2-A Hahl, Survey 51, located 150 feet to the east line and south lines, is drilling at 2,607 feet; No. 2-B Hahl, Survey 61, located 3,381 feet to east line and 150 feet to south line, is location. Sun Oil Co.'s No. 1 W. P. Norton, Survey 250, located 150 feet to south and east lines, is moving in machinery.

S. & O. Oil Co.'s (Schoolfield-O'Byrne & Pearson) No. 1 Bowe, Survey 250, Block 21, located 150 feet to the north and east lines, is drilling at 2,080 feet. Onyx Oil Co.'s (Schoolfield-O'Byrne & Pearson) No. 2 Norton (formerly No. 2 Krauter), Survey 250, Block 19, located 558 feet to east line and 150 feet to the south line, has sand at 2,329 feet. The Texas Company's No. 1 Hahl, Survey 250, Block 18, located 150 feet to the north and west lines, is drilling at 800 feet.

Randado Field—Jim Hogg

Magnolia Petroleum Co.'s No. 41 Merchants State Bank, Survey 155, located 150 feet to the north and east lines, is drilling at 200 feet. T. J. Conway's No. 1 C. Palacious, Survey 232, Block 6, located 175 feet to the north line and east lines, is drilling at 1,410 feet. Randado Oil Co.'s (American Well & Prospect Co.) No. 25 Palacious has been spudded in.

Alworth Field

Alworth-Stevens-Hild's No. 13 M. Garza, Survey 39, Block 9, located 115 feet to the northwest lines and 630 feet to the northeast lines, at 1,020 feet is testing and showing oil.

Reiser Field

Marts & Beavins' No. 1 Johnson, Survey 1,617, Block 9, located 500 feet to north line and 100 feet to west line, is drilling at 2,250 feet. R. C. Holsworth's No. 1 Wheatley, Survey 1,569, Block 3, located 847.7 feet to the north line and 305.2 feet to the east line, is standing at 1,481 feet.

Schott-Mirando Field—Webb

O. W. Killam's No. 1 Killam, Survey 457, located 1,470 feet to the west line and 2,490 feet to the north line, is moving on.

Mid-Ojuelos Pool

Aviator Gas Co.'s No. 1 E. Garcia, Survey 606, Block 11, located 150 feet to south and east lines, at 1,605-10 feet shows oil and is going on the pump.

Albercas Field

O. W. Killam's No. 26 Bruni, Block 64, located 975 feet to the west line and 1,510 feet to the south line, is testing at 2,201-04 feet; No. 27 Bruni, Block 64, located 2,902 feet to the south line and 947 feet to the west line, is drilling at 200 feet. Magnolia Petroleum Co.'s No. 13 Yeager-Strohman, Share 5, located 150 feet to west line and 750 feet to the south line, is drilling at 2,500 feet.

Houston Oil Co.'s (Rycade) No. 2-A Yeager-Strohman, Share 5, located 381 feet to the north line and 2,248 feet to the east line, has set 10-inch casing at 42 feet. Sun Oil Co.'s No. 7-A Yeager-Strohman, Share 5, located 3,175 feet to the north line and 150 feet to the west line, is drilling at 2,000 feet.

Aviator Field

G. C. Salley's No. 1 Puig, Carter-Pinkton tract of Puig ranch, 220 feet to west line and 150 feet to south line, is rigged up and standing. Suladie & Mimms' No. 1 Puig, 450 feet to east line and 155 feet to north line of Puig (Kirkpatrick) tract, at 1,838-34 feet is testing on drill stem tester.

Carolina-Texas Pool

C. R. Miller's No. 1 de la Garza, Survey 48, Block 47, located 150 feet to the north and east line, is drilling at 1,370 feet.

Andrews Field

Gleason Oil Co.'s No. 2 Benavides, Survey 11, Block 11, located 300 feet to northwest lines and 250 feet to northeast lines, is drilling at 1,450 feet.

Magnolia-Cole Field

Cole Petroleum Co.'s No. 65 Benavides, Survey 412, Block 4, located 1,060 feet to west line and 160 feet to north line, is drilling at 1,700 feet. Houston Oil Co.'s No. 4-D Benavides, Survey 753, Block 13, located 160 feet to south line and 822.5 feet to east line, is location; No. 17-D Benavides, Survey 753, Block 5, located 160 feet to south and west lines, is location. Magnolia Petroleum Co.'s No. 12 Valdez, Survey 754, Block 16, located 750 feet to south line and 650 feet to west line, is drilling at 1,600 feet.

Jennings Field—Zapata

South Texas Production Co.'s No. 1 Jennings, Cerrito Blanco grant, 8,890 feet to southwest lines and 8,750 feet to southeast lines, at 1,420-27 feet tested gas with 500 pounds rock pressure. O. W. Killam's No. 5 Cuellar, Cerrito Blanco grant, 1,000 feet to southeast lines and 670 feet to southwest lines of tract, has derrick up; No. 6 Cuellar, 690 feet to northwest lines and 825 feet to southwest lines (location changed) of tract has sand at 1,459-63 feet and has set casing at 1,459 feet. Killam-Duggan's No. 3 Cuellar, 3,037 feet to northeast lines and 3,300 feet to northwest lines, at 2,410 feet is plugging back to 1,459 feet to test sand at that depth, casing set at 1,438 feet.

Luling Field—Caldwell

M. W. Koening's No. 7 Tiller, John Henry Survey, 300 feet east of No. 6, at 2,108 feet in Edwards will test showing in Austin before setting casing and coming in Edwards lime. Magnolia Petroleum Co.'s No. 13 W. J. Tiller, John Henry Survey, 150 feet to southwest lines and 450 feet to southeast lines, has been completed at 2,148 feet; No. 8 W. Branyon, Nancy Reaville Survey, SE cor. of survey, has been completed at 2,168 feet.

Joe Bruner Field

Pat Armstrong's No. 1 E. Martin, A. Floyd Survey, 150 feet to northeast lines and 410 feet to southeast lines, is setting casing at 2,680 feet. Abercrombie & Co.'s No. 1 Lida Moses, A. Floyd Survey, 150 feet to north and west lines, is in top of Edwards at 2,711 feet. Carl Brothers-Suttle's No. 1 C. W. Malone, A. Floyd Survey, 150 feet to northwest and northeast lines, at 2,554 feet is cleaning out to deepen to the Edwards.

Cranfill & Reynolds' No. 1 W. L. Smith, A. Floyd Survey, 150 feet to south and west lines, is location, derrick up and rig moving in; No. 2 W. L. Smith, A. Floyd Survey, 150 feet to center of south line, is drilling at 2,343 feet. Date Oil Co.'s (Tackleberry) No. 1 W. W. Hickman, Gerren Hinds Survey, is drilling at 2,480 feet. Golden West Oil Co.'s No. 1 Cook, A. Floyd Survey 480 feet to northeast lines and 170 feet to northwest lines, is drilling in at 2,226 feet with cable tools.

T. D. Hadley's No. 1 Tiller, Gerren Hinds Survey, cored Edwards at 2,828 feet; No. 2 Wilson, J. Radford Survey, is standing at 2,800 feet. M. S. Holladay's (J. T. Barlow) No. 1 Bouldin is shut down at 3,070 feet. C. E. Lange's No. 1 Kate Colding, A. Floyd Survey, 150 feet to northwest lines and 112 feet to northeast lines, is location. Larson-Walsh's No. 1 Fred Watson, Solomon Seal Survey, 150 feet to northeast and southeast lines, at 2,749 feet, total depth, shot in the Austin and is cleaning out.

Lutex Oil, Inc.'s, No. 1-A W. F. Davis, A. Floyd Survey, 150 feet to northwest and northeast lines of lease, is drilling at 1,700 feet; No. 5 Davis, A. Floyd Survey, is location; No. 3 Frank Davis, A. Floyd Survey, 150 feet to northeast and southeast lines, is drilling at 2,374 feet; No. 4 Davis, A. Floyd Survey, 300 feet west of No. 1 Davis, at 2,771 feet cored Edwards. Plum Creek Oil Co.'s No. 1 E. L. Mayton, Hector McNeil Survey, in center of survey, is standing at 240 feet.

H. C. Ratcliffe and others' No. 1 Cora Malone, A. Floyd Survey, 150 feet to north and west lines, is in top of chalk at 2,302 feet. Sun Oil Co.'s No. 2 Malone, A. Floyd Survey, 300 feet northwest of No. 1, is drilling at 2,688 feet in Georgetown. The Texas Company's No. 1 M. Merriweather, A. Floyd Survey, 150 feet to southeast lines and 750 feet to northwest lines, is drilling at 735 feet; No. 2 M. Merriweather is drilling at 590 feet.

Turman & Brown's No. 1 City of Luling, A. Floyd Survey (formerly M. L. Brown's No. 1 Jackson and others), 150 feet to northeast and southeast lines, is drilling at 400 feet. M. K. Towns' No.

(Continued on Page 116)

BASTROP COUNTY WELL FLOWS 300 BBLS.; COMPANY STARTS ANOTHER

By B. D. Stevenson

SAN ANTONIO, Tex., Nov. 19.—Cranfill & Reynolds' No. 1 Yost in southwest Bastrop County, reported last week flowing 175 bbls. of oil a day from Serpentine at 1,598 feet, has since been flowing about 300 bbls. The company is starting another test 300 feet north of it and is down pretty well on it. There is not the excitement over these Serpentine wells that there was formerly, owing to the fact that the Serpentine well in the Lytton Springs Townsite found on Sun acreage by Cranfill & Reynolds has been offset on the north and south with holes that failed to find any Serpentine at all. Hence operators will await developments on this Serpentine well even though it looks as though it would be a good field.

So much attention is centering in the new fields of Southwest Texas that operators have not much time for wildcatting but the North & South well on the Nehr farm south of D'Hanis in Medina County at 990 feet is getting formations a little higher than had been expected and to that extent is looking good.

Then there is some lease activity in spots. In Guadalupe County, southwest from the old Luling Field and the new Joe Bruner Field, there is activity and fairly high prices have been paid. Prospects that the Edwards lime will pay off in other places is the main incentive.

Down in northern Bee County where leasing activity is going on as reported last week the activity is extending across into Live Oak County. The small amount of gas found in the Dr. D. Hewitt's No. 1 Ray in Bee County, is right in line northeast and southwest with the production of shallow gas wells at Oakville and Three Rivers in Live Oak County 15 or 18 miles to the southwest and the line from one to the other is about the trend that fields take in that part of the country or supposedly would take if found, due to the influence of the Balcones Fault. It is not really new territory in Live Oak County since considerable drilling has been done around Three Rivers and Oakville but there is a chance that a structure will be located in that area.

Duval County

National Oil Co.'s No. 2 Ball, 300 feet to north and west lines of Block 5 of subdivision of Ball ranch, has derrick up.

Starr County

The Texas Company's No. 1 Ofelia Resendez, Porcion 69, Block 174, located 150 feet to south and east lines, is drilling at 1,200 feet.

Webb County

Baku Oil Co.'s No. 1 A. M. Bruni, Survey 735, Block 7, located 450 feet to north line and 150 feet to east line, is drilling at 1,450 feet. William R. Jewell's (T. P. Morgan) No. 1 J. M. Gutierrez, Survey 857, Block 8, located 150 feet to south and west lines, is standing at 80 feet. O. W. Killam's No. 5 Billings, Survey 712, located 1,780 feet to north line and 2,548 feet to west line, is drilling at 2,200 feet. Suladie and others' No. 1 Neall, Survey 1,008, is location 2,490 feet to south line and 150 feet to east line. Callaghan Land & Pastorial Co.'s No. 3 Callaghan, Survey 440, located 2,144 feet to south line and 1,482 feet to east line, is drilling at 480 feet.

Zapata County

National Oil Co.'s No. 1 Don B. Adams, C N half Section 11, Block 4, of subdivision of Adams tract, is moving in the machinery.

Bastrop County

Gypsy Producing Co.'s No. 1 Lottman estate is shut down at 2,146 feet. Col. Billy Mayfield's No. 1 McColl, Stephen F. Austin Survey, 450 feet to south of river and 750 feet to east line of farm, is sidetracking at 592 feet.

Bexar County

Dixie Oil Co.'s No. 1 Medina Irrigation Co., William Miller Survey No. 180, located 1,666 feet to north line and 470 feet to west line, has been spudded in. F. H. Eckert's No. 2 Dobrowolski, Section 4, Survey 52, located 300 feet north of No. 1, is location. Humble Oil & Refining Co.'s No. 1 D. and A. Oppenheimer, 450 feet east of the Pleasanton Road, and 750 feet to south line of the tract, is drilling at 1,217 feet. Marland Oil-Sun Oil Co.'s No. 1 J. B. Stewart, Manuel Monjarias Survey, 200 feet northeast and southeast of E. B. Simmons farm, is drilling at 2,546 feet.

Blanco County

C. W. Bates' No. 1 Herman Massey,

(Continued on Page 116)

Gardner 7¼×14 Power Pumps

"The Best Performing..... .....Pumps I Have Ever Used"

The Klingensmith Drilling Company is among those using Gardner 7¼x14 Enclosed Power Pumps for rotary drilling in the St. Louis, Okla., field. C. R. Trail, tool pusher and part owner, says "they are the best performing pumps I have ever used."

Gardner Enclosed Power Pumps are available in any size and equipped for any desired type of drive. Ask for Bulletins.

GARDNER-DENVER COMPANY
QUINCY, ILL.

BRANCHES IN OIL FIELDS:

Dallas, Texas, 2508 Commerce St.
Denver, Colorado.
Houston, Texas, 611 Second Natl. Bank Building.
Los Angeles, Calif., 939 Santa Fe Avenue.
San Francisco, Calif., 163 First Street.
Tulsa, Oklahoma, 502 Tulsa Trust Building.
New York, N. Y., 30 Church St.
Chicago, Ill., 825 Washington Boulevard.
Philadelphia, Pa., 2033 Market St.
London, England, 56 Kingsway, W. C. 2.

OIL COUNTRY DISTRIBUTORS:

Atlas Supply Company, Muskogee, Tulsa and Fort Worth.
C. F. Camp Company, Tulsa.
Emsco Derrick & Equipment Co., Los Angeles and Tulsa.
Haywood-Williamson, Shreveport and El Dorado.
International Supply Company, Stores in all Principal Mid-Continent Fields.
Norvell-Wilder Hardware Co., Beaumont, Houston and Fort Worth.
The Republic Supply Co. of California, Stores in all Principal California Oil Fields.

GARDNER-DENVER

Spectacular Gassers in California

Fourth Blows in at Potrero. Kettleman Hills Well Makes 4,000 Bbls. 60 Gravity. Santa Fe Springs 150,000 Bbls. by End of Year

By L. P. Stockman
Staff Correspondent, California Fields

LOS ANGELES, Calif., Nov. 19.—Development work in California during the past several weeks has been especially conspicuous by a series of spectacular gas wells which blew in out of control, two of them taking fire immediately following their advent. Both of these gassers were located in the Santa Fe Springs Field where deep zone production is rapidly becoming a factor of great importance and may possibly exceed 150,000 bbls. daily shortly after the first of the new year. Current production of the deep zone is 42,500 bbls. daily, but this will be pushed to above the 75,000-bbl. mark within the next 30 days as there are a number of new potential producers nearing completion.

California's latest gas well was the Associated's No. 1 Voorhis in the Potrero Field of Los Angeles Basin, which blew in prematurely on November 13 and ran wild for several days before being successfully brought under control late Friday evening, November 16. This well blew in doing 3,000,000 feet of gas and 2,000 bbls. of water daily while a water test was in progress, but was subsequently killed by pumping in heavy mud.

The Bellview company's No. 2 Grohs at Santa Fe Springs is still running wild but this gasser, which blew in November 8 and took fire immediately, is expected to be brought under control within two or three weeks unless something unforeseen develops. Engineers and representatives of the major companies operating in this field held a conference a few days ago and it was definitely decided to dig a tunnel and undertake control work beneath the surface as was successfully done by General Petroleum engineers a few weeks ago when subduing George Getty's wild gasser, No. 17 Nordstrum, which burned continuously for 48 days. Operators have been obliged to form a pool to provide adequate funds with which to extinguish this burning jet of gas. The money advanced to meet the expenses incurred in controlling No. 2 Grohs will be repaid out of the first production secured from this well and contributors will be further protected to the extent of being permitted to drill one or more new wells on this lease in order to liquidate expenses in case this well is lost. No appreciable amount of oil is coming to the surface yet and it is impossible to determine what production of crude may be anticipated when this project has been brought under control.

George Getty's gasser, it will be recalled, began flowing 5,800 bbls. daily after being capped and it is still holding up to this figure with clocklike regularity, making 4,000 bbls. 60 gravity.

California's other big gasser was the Milham Exploration Co.'s No. 1 Elliott, the discovery well which opened the Kettleman Hills Field of Kings County. This well did not take fire, although control work was exceedingly dangerous because of the unusually high gravity oil and large amount of natural gasoline which was being precipitated in all directions. Four gas traps have been installed and this well is now making 4,000 bbls. of 60 gravity oil and upon completion of the gasoline plant will produce 100,000 gallons of natural gasoline daily.

The past week was an exceptionally busy one for California producers as drilling operations resulted in the completion of numerous prolific flowing wells. Some 24,250 bbls. of new production was added at Santa Fe Springs Springs, 4,850 bbls. at Elwood, 7,569 bbls. at Long Beach and the Bolsa Chica Oil Co. wound up the week by completing its No. 3 Hartman in the Ventura Avenue Field flowing 5,008 bbls. daily from 7,210 feet.

Ten wells are producing from the deep zone in the Santa Fe Springs Field at present, five new producers having been finished during the past week. The new wel's brought in were George Getty's No. 8 Nordstrum, doing 3,250 bbls. daily, Universal Consolidated's No. 7 Blanchard making 5,850 bbls., Union Oil Co.'s No. 30 Bell doing 4,800 bbls. and the Star Petroleum's No. 2 flowing 20,000,000 feet of natural gas and 2,100 bbls. of oil daily. The Shell also recompleted No. 12 Slusher this week and it was returned to production flowing 2,800 bbls. daily.

Santa Fe Springs

The Associated Oil Co. focused the attention of operators on the Santa Fe Springs Field early in the past week by bringing in No. 2 Jordan, flowing 8,250 bbls. of clean 35.1-gravity oil and 2,500,000 feet of wet gas daily, and unless something unforeseen develops will finish two additional producers within 15 days. This well is the largest producer finished in the Santa Fe Springs Field since deep-zone development got under way several months ago, and the company's geological department deserves considerable commendation for the efficient handling of this large well. No. 2 Jordan, bottomed in the Buckbee zone at 5,747 feet, was finished with a 4¾-inch oil string, a 9-inch water string having previously been landed and cemented at 5,618 feet. The Bellview Oil Co.'s wild gasser, No. 2 Grohs, has completely demoralized drilling operations in its immediate vicinity, and work has been suspended on 26 projects. One of these most vitally affected was York & Lockhart's No. 1 McKeon, a recent completion brought in flowing 3,015 bbls. per day from 5,707 feet. This well was in close proximity to the Bellview's gasser, and it was necessary to pull down the wooden rig and close all gates to minimize the fire hazard. A wall of corrugated sheet iron was hastily thrown up around this producer and all equipment removed from the lease, including the flow tanks. After being shut in for several days, the company concluded arrangements whereby it secured the privilege of erecting tanks several hundred feet away, and these storage facilities were ultimately hooked up. This project was again turned loose and is yielding 2,940 bbls. per day. After being opened up, the Christmas tree was effectively buried by utilizing several truck loads of dirt, which has been well packed and wetted down.

Elwood

The Barnsdall Oil Co. finished its third successful completion in the Elwood Field of Santa Barbara County several days ago, and this new project, No. 1 Doty, came in flowing 4,850 bbls. of exceptionally clean 39.1-gravity oil and 1,500,000 feet of wet gas daily. This well, drilled to 3,386 feet, was finished with a 6¼-inch liner carrying 110 feet of perforated and 3,190 feet of 2½-inch tubing. The top of the oil zone was encountered at 3,275 feet and showed such an exceptionally heavy gas pressure the crew gave up the attempt to make a water test, as they were afraid to bail it down. No. 1 Elwood Acres, 6,003 feet east of the Barnsdall's discovery well, failed to result in commercial production when given a preliminary production test a few days ago, and preparations are being made to resume work. The Barnsdall is rigging up rotary equipment in No. 3 Bell, a new well, and is putting up three additional derricks for No. 2 Doty and Nos. 4 and 5 on the Bell property. These four projects will probably all be making hole within two or three weeks. Matthew C. Brush, chairman of the Barnsdall Oil Corp., and E. B. Reeser and James A. Dunn, president and vice president, respectively, visited the Barnsdall's holdings at Elwood during the week, and are enthusiastic over the outlook. One of the most interesting results of this inspection was the intimation that production at Elwood might be stepped up to in excess of 50,000 bbls. daily before the close of the next six months. The future production at Elwood depends almost entirely on the desires of the Barnsdall, as this field can very easily exceed the 50,000-bbl. mark by additional drilling. None of the various other projects started in the Elwood area subsequent to completion of the Barnsdall's discovery well has yet encountered anything of a definitely promising nature. The Petroleum Securities logged a heavy tar showing in its No. 1 Storke a few days ago at 2,520 feet and might bear watching, as the surface showings logged might be the forerunner of something better. Dunlap & Knapp have just passed the 4,000-foot level in No. 1 Orphan, on an odd lot west of the Barnsdall's No. 1 Elwood Acres,

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

Company, well, location—	S-T-R	Depth	Status—
Ring, Pet. Co., No. 1 Inglewood, Los Angeles Co.	28- 2-14	4,352	suspended
Mont. Park Oil Co., No. 1 Browning, Monterey Park	26- 1-12	4,420	suspended
Mont. Park Pet. Co., No. 1 Jepson, Monterey Park	25- 1-12	3,250	sd. sh. drilling
World Pet. Corp., No. 1 Bell, Los Angeles Co.	22- 3-12	2,915	suspended
Associated, No. 1 Taylor, Los Angeles Co.	33- 2-12	4,940	sd. sh. drilling
Empire Drlg. Co., No. 1 Bell, Los Angeles Co.	14- 2-12	4,502	suspended
Continental Oil Co., No. 1 La Mirada, Los Angeles Co.	10- 3-11	4,418	hd. sd. drilling
Shell, No. 2 Mission, San Fernando	4- 2-15	5,202	gr. sd. drilling
Andrews, Otis, No. 1 Lancaster, Los Angeles Co.	23- 8-13	2,080	suspended
Security Pet. Co., No. 1 Lynwood, Los Angeles Co.	13- 3-13	5,333	suspended
Richfield, No. 1 Maywood, Los Angeles Co.	13- 2-13	500	sd. drilling
Harding, J. B. No. 1 Watts, Los Angeles Co.	17- 3-13	579	wtr. trouble
Easton & Smith, No. 1 Calabasas, Los Anegels Co.	19- 1-17	2,982	suspended
Russell Oil Co., No. 2 Joughin, Los Angeles Co.	25- 3-17	1,008	suspended
Mallory, Ellis, No. 1 Manhattan, Los Angeles Co.	30- 3-14	125	suspended
Pomona Oil Co., Well No. 1, Los Angeles Co.	32- 1- 8	1,075	clean. out
Anchor Oil Co., No. 1 Puente, Los Angeles Co.	19- 2-10	4,820	fishing
Richfield Oil Co., No. 1 Puente, Los Angeles Co.	9- 2-10	2,370	sd. sh. drilling
Calif. Eastern, No. 1 Wicks'am, Los Angeles Co.	32- 5-17	1,970	hd. sd. drilling
The Texas Co., No. 1 Anaheim, Orange Co.	35- 4-10	140	sd. drilling
Bastanchury Ranch Co., Well No. 1 Orange Co.	21- 3-10	rig	suspended
Mesa Pet., No. 1 Newport, Orange Co.	21 -6-10	3,255	recemented
West. Drlg. & Prod. Co., No. 1 Newport, Orange Co.	18- 6-10	2,018	gr. sd. drilling
Hall Pet. Co., No. 1 Murretta, Riverside Co.	23- 7- 3	931	cleaning out
Hemet Pet. Co., No. 1 Ward, Riverside Co.	9- 5- 1	3,955	hd. sd. drilling
Davenport O. & G., No. 1 San Marcos, San Diego Co.	30-12- 2	865	hd. sd. drilling
Turner, S. S. No. 1 Escondido, San Diego Co.	25-12- 2	1,600	cemented
Torrey Pines Oil Co., Well No. 1, San Diego Co.	18-14- 3	1,974	suspended

IMPORTANT NORTHERN CALIFORNIA WILDCATS

Milham Explt'n., No. 1 Kettleman, Kings Co.	2-22-17	7,235	4,000 bbls.
Standard, No. 71 fee Kettleman, Kings Co.	11-21-17	....	location
Bolsa Chica, No. 1 Kettleman, Kings Co.	20-25-19	3,502	suspended
Bolsa Chica, No. 2 Kettleman, Kings Co.	20-22-18	....	location
California Oil Co., No. 1 Kettleman, Kings Co.	12-23-19	rig	suspended
General Pet. Co., No. 2 Ochsner, Kettleman Hills	26-22-18	6,755	cleaning out
Miley Oil Co., Well No. 1, Kettleman Hills	24-22-18	....	location
South Coalinga, Well No. 1 Kettleman Hills	35-24-19	3,140	bl. sh. drilling
Monocline Dev. Co., Well No. 1 Kettleman Hills	7-21-21	4,308	suspended
McPhail, Hugh, Well No. 1 Kettleman Hills	13-24-18	2,100	suspended
California West. Oil Co., No. 1 Elkins, Ventura Co.	28- 4-19	2,951	testing
Exline, Emma, No. 1 Saticoy, Ventura Co.	33- 3-21	2,412	fishing
Ohio Oil Co., No. 1 Saticoy, Ventura Co.	32- 3-21	461	cemented
Standard, No. 5 Saticoy, Ventura Co.	1- 3-22	3,321	hd. sd. drilling
Petroleum Sec., No. 1 Diablo, Ventura	26- 5-18	6,350	hd. sd. drilling
American Oil Co., No. 1 Camarillo, Ventura Co.	33- 2-20	561	set pipe
Star Pet. Co., No. 2 Canet, Ventura Co.	13- 3-23	6,775	suspended
Shell, No. 1 Grubb, Ventura Co.	26- 2-22	5,310	cleaning out
Bolsa Chica, No. 1 Temescal, Ventura Co.	3- 4-18	mtl.	bld. rig
Miley, E. J., No. 2 Casitas, Ventura Co.	12- 3-21	785	sd. sh. drilling
Shell, No. 2 Berlywood, Moorpark	33- 3-20	7,240	suspended
Continental, No. 1 Sulphur Mtn., Ventura Co.	21- 4-22	2,404	br. sh. drilling
Continenta No. 2 Sulphur Mtn. Ventura Co.	22- 4-22	2,740	br. sh. drilling
Milham Explt'n., No. I-A Buttonwillow, Kern Co.	8-28-23	4,652	gas well
Milham Explt'n., No. 2 Buttonwillow, Kern Co.	8-28-23	2,730	gas well
Milham Explt'n., No. 3 Buttonwillow, Kern Co.	8-28-23	2,694	gas well
Milham Explt'n., No. 4 Buttonwillow, Kern Co.	6-28-23	2,670	gas well
Milham Explt'n., No. 5 Buttonwillow, Kern Co.	5-28-23	2,500	gas well
Milham Explt'n., No. 6 Buttonwillow, Kern Co.	8-28-23	2,676	gas well
Milham Explt'n., No. 7 Buttonwillow, Kern Co.	6-28-23	2,720	suspended
Milham Explt'n., No. 8 Buttonwillow, Kern Co.	16-28-23	3,460	hd. sd. drilling
Doheny-Stone, No. 1 Salisbury, Kern Co.	7-29-24	4,291	suspended
South. Calif. Gas Co., No. 1 Buttonwillow, Kern Co.	4-28-23	4,272	suspended
South. Calif. Gas Co., No. 2 Buttonwillow, Kern Co.	27-28-23	rig	suspended
Richfield Oil Co., No. 1 Semitropic, Kern Co.	21-26-22	4,450	sd. sh. drilling
Pacific Eastern, No. 1 Union Ave., Kern Co.	6-30-28	5,640	suspended
Pacific Eastern, No. 2 Union Ave., Kern Co.	6-30-28	4,500	suspended
Pacific Eastern, No. 3 Union Ave., Kern Co.	6-30-28	4,443	gas—shut in
Pacific Eastern, No. 4 Union Ave., Kern Co.	6-30-28	5,450	abandoned
Pacific Eastern, No. 5 Union Ave., Kern Co.	5-30-28	4,991	suspended
Stabler, W. W., No. 1 Comanche Point, Kern Co.	23-32-29	2,860	fishing
General Pet., No. 3 Edison, Kern Co.	5-30-29	1,280	hd. sd. drilling
Midway Northern, No. 1 Edison, Kern Co.	29-29-30	3,775	suspended
Pelzel, S. A., Delano, Kern Co.	4-26-27	3,116	suspended
Pacific Coast Oil Co., No. 1 Rio Bravo, Kern Co.	15-29-25	42	cemented
Elmer Oil Co., No. 1 Shafter, Kern Co.	8-28-25	3,714	sd. sh. drilling
Standard, No. 1 San Emidio, Kern Co.	35-11-22	2,970	hd. sh. drilling
Union, No. 1 San Emidio, Kern Co.	5-10-21	rig	rigging up
Fresno Madera Oil Co., No. 1 Clovis, Fresno	18-12-21	4,194	suspended
Currency Pet. Co., No. 1 Vineyard, Fresno Co.	28-21-14	116	suspended
Union, No. 1 Huasna, San Luis Obispo	34-32-15	3,160	reaming
Union, No. 1 North Huasna, San Luis Obispo Co.	12-32-14	2,092	cemented
Panorama Oil Co., Well No. 1, San Luis Obispo Co.	7-31-21	3,135	br. sh. drilling
Sequoia Oil Co., Well No. 2, San Mateo Co.	15- 7- 5	1,605	suspended
Sunset Pacific, No. 1 Saratoga, San Mateo Co.	13- 7- 4	rig	suspended
Shell, No. 2 Cowell, San Mateo Co.	8- 6- 5	3,694	testing
Shell, No. 1 Butts, San Mateo Co.	16- 6- 5	3,342	suspended
Shell, No. 3 Petaluma, Sonoma Co.	8- 5- 7	1,152	hd. sd. drilling
Calhoma Oil Co., No. 1 Livermore, Alameda Co.	9- 3- 2	1,350	suspended
Foster & Hammill, Well No. 1, Alameda Co.	21- 3- 3	rig	suspended
R. Y. Hanlyn, Well No. 1, Alameda Co.	3- 5- 2	334	hd. sd. drilling
Shell, No. 1 Refugio, Santa Barbara Co.	31- 5-30	....	location
Standard, No. 1 Lompoc, Santa Barbara Co.	....	rig	rigging up
Standard, No. 1 Arguello, Santa Barbara Co.	1- 4-34	....	location
Tepesquit Oil Co., Well No. 1, Santa Barbara Co.	3- 9-32	2,710	suspended
Becker, Geo. F., No. 1 Summerland, Santa Barbara Co.	33- 4-25	3,090	suspended
Continental, No. 1 Carpenteria, Santa Barbara Co.	33- 4-25	2,100	reaming
Southwest Prod. Co., Well No. 1, Santa Barbara Co.	2- 4-28	1,625	cemented
Colus Oil Co., Well No. 1, Colusa Co.	31-15- 4	380	redrilling
Nuna Oil Co., Well No. 1, Colusa Co.	19-15- 5	400	hd. sd. drilling
Superior Oil Co., No. 1 Calivada, Colusa Co.	31-15- 4	1,011	suspended
North Counties Oil Co., Well No. 2, Humboldt Co.	36- 2- 1	2,205	suspended
Humboldt Oil Co., Well No. 1, Humboldt Co.	6- 2- 1	3,041	redrilling
Kuhns, H. L., Well No. 1 Merced Co.	9-12- 9	1,520	hd. sd. drilling

but nothing of importance has been logged up to the present time.

Kettleman Hills

The Milham Exploration Co. completed the final hook-up of its discovery well, in the Kettleman Hills Field of Kings County, several days ago, and this project is flowing 4,250 bbls. of clean 60.2-gravity oil daily. The two gas traps originally installed have been augmented by two more, and the company is handling 34,000,000 feet of wet gas daily. The Texas Company recently completed a contract with the Milham interests whereby it will erect adequate facilities and handle all wet gas on a 50-50 basis, and this new installation will be in operation shortly. The Standard Oil Co., which owns every alternate section, or 640 acres, in fee, has staked location for two new wells in this district, and both projects will be spudded in shortly. E. J. Miley and the Bolsa Chica Oil Co. are also making preparations to start new wells, the former's holding being in Section 24-22-18 and the latter's in Section 20-22-18. The General Petroleum's new pipe line, which will extend from the Kettleman Hills Field southward to Lost Hills, approximately 30 miles, will probably be in operation within 30 days. The Milham Exploration Co. is transporting its present crude-oil production from Kettleman Hills to Coalinga by truck, where it is being sold to the Shell Oil Co. The Kettlemant Hills Field is expected to be one of California's largest fields in productive acreage, and a number of additional drilling projects are scheduled to get under way. This field will be devoid of any town-lot areas, and development work will be along conservative lines.

Long Beach

There were nine wells put on production in the Long Beach Field during the week and a check of the remaining 186 drilling projects indicates the probable completion of about five more during the coming week. Four new wells have been started down to the deep zone, the Apex Petroleum spudding in No. 13-B almost simultaneous with the starting of No. 2 Clark of the Chiksan Oil Co., No. 4 Long Beach of the D'Angelo Oil Co. and No. 6 Babb & Tuckner of the Shell. The Italo Petroleum Corp. started off by completing its No. 1 Knight, flowing 2,450 bbls. of clean 30.2-gravity oil and 3,100,000 feet of wet gas daily from 7,316 feet, the hole having been finished with a 4¾-inch oil string cemented through perforations at 6,935 feet. This well, heretofore known as McKeon Drilling Co.'s No. 1 King Tut, was a former upper zone producer. The Olympic Refining Co. successfully finished its No. 14 Delendrecio, a new well in the deep zone, which showed an initial production of 1,160 bbls. of clean 29.6-gravity oil and 1,600,000 feet of wet gas daily. This project, carried down to 6,853 feet, was finished with a 5¾-inch oil string carrying 805 feet of perforated, which was landed on bottom and cemented through perforations at 6,038 feet. The General Petroleum also chalked up a new well when No. 6 Jonah Jones was brought in under a natural flow doing 690 bbls. daily from 6,796 feet.

The Richfield Oil Co.'s No. 3 Bernstein and the South Basin Oil Co.'s No. 2 Nakamura both showed relatively small production upon completion. These two new wells were finished at 6,713 feet and 6,795 feet respectively, the former showing an initial daily production of 420 bbls. and the latter 440 bbls. daily. The State Co. has its No. 1 Bradbury back on production again following a period of experimental work undertaken in an effort to determine the most satisfactory completion depth. This well, located in the Los Cerritos area of the Long Beach Field, was originally given a production test at 8,065 feet, but has subsequently been plugged back to 7,630 feet, from which it is making 640 bbls. per day. The Richfield Oil Co., which is running 28 strings of tools in this field, finished No. 8 Ramsauer Community, doing 1,474 bbls. of 29.8 gravity oil daily from 6,893 feet, the hole having been finished with a 5¾-inch oil string carrying 946 feet of perforated. The Shell's No. 5 Kent Garth was a distinct disappointment, as it only showed an initial of 140 bbls. of 28.2-gravity oil daily from 7,847 feet. The California Eastern Oil Co.'s No. 62 Marine also failed to come up to expectations, as it tanked only 155 bbls. daily when put on a production test after being redrilled and deepened to the lower zone at 7,301 feet.

TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS

Commodity—	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Crude oil	.....	.....	.....	.....	2,839,582	1,244,961
Fuel oil	.....	.....	.....	.....	143,471	6,788,733
Diesel and gas oil	.....	.....	71,150	10,164	1,745,589	2,375,151
Gasoline	338,556	48,365	306,384	43,769	12,334,562	8,123,375
Tops	.....	.....	.....	.....	339,100	.....
Coastwise—						
Crude oil	415,111	59,302	222,743	31,820	21,107,331	21,611,849
Fuel oil	459,090	65,584	393,285	56,184	14,607,186	11,651,566
Diesel and gas oil	31,647	4,521	.....	.....	995,427	356,860
Gasoline	248,118	35,445	147,721	21,103	8,182,244	8,994,922
Kerosene	.....	.....	859	123	66,757	230,801
Tops	.....	.....	.....	.....	171,566	219,255
Exports—						
Crude oil	63,250	9,036	54,875	7,839	1,903,582	2,138,240
Fuel oil	445,643	63,663	313,941	44,849	19,667,521	25,280,295
Diesel and gas oil	32,781	4,683	.....	.....	2,000,121	1,264,274
Gasoline	250,598	35,800	182,532	26,076	6,572,420	4,601,903
Tops	.....	.....	.....	.....	.....	302,303
Kerosene	177,589	25,370	55,927	7,990	3,719,590	1,953,467

TANKER SHIPMENTS FROM SAN FRANCISCO TO ATLANTIC, GULF COAST PORTS

Diesel and gas oil	.....	.....	.....	.....	342,425	900,061
Gasoline	79,963	11,423	.....	.....	1,830,132	2,042,773
Lubricants	.....	.....	.....	.....	277,151	439,367
Coastwise—						
Fuel oil	4,002	572	.....	.....	3,054,074	4,643,609
Diesel and gas oil	3,993	570	.....	.....	271,204	223,583
Gasoline	101,274	14,468	260,408	37,201	4,225,596	4,617,617
Kerosene	.....	.....	11,264	1,609	214,441	213,109
Exports—						
Crude oil	.....	.....	.....	.....	96,250	.....
Fuel oil	.....	.....	.....	.....	2,063,154	2,381,308
Diesel and gas oil	45,780	6,540	.....	.....	56,180	.....
Gasoline	64,029	9,147	.....	.....	3,886,747	2,678,443
Kerosene	65,493	9,356	.....	.....	536,253	897,155
Lubricants	.....	.....	.....	.....	33,535	26,695

Rosecrans

The Richfield Oil Co. successfully recompleted its No. 1 Rosecrans in the deep zone of the Rosecrans Field of Los Angeles Basin, and it was returned to production doing 490 bbls. of 30.3-gravity oil daily. This well, drilled to 5,815 feet, and finished with a 6⅝-inch oil string landed and cemented at 4,760 feet, will probably require additional work, as the output is still cutting about 40 per cent water. The Barnsdall, which has finished three excellent producers in the Elwood Field of Santa Barbara County, which it discovered a few months ago, should have No. 13 O'Dea in the Rosecrans Field on production within two or three weeks, as this well is rotating in the oil sand at 5,273 feet, and unless something unforeseen develops, No. 1 Rosecrans will also be tanking oil shortly. Although drilling operations in the Brea Olinda, or Fullerton Field of Orange County, are limited to only a relatively few wells, a check of development work indicates the probable early completion of the Brea Canyon Oil Co.'s Nos. 44 and 45, as these projects are drilling in the oil sand at 5,255 and 4,950 feet, respectively.

Huntington Beach

Drilling at Huntington Beach, which has become spotted because of the intensive development work under way at Santa Fe Springs and the continuance of relatively flush production at Long Beach, has only resulted in the completion of a limited number of new wells during the past several months. It is likely that the Standard and Union will both chalk up a new well in this district shortly, as the former's No. 39 Bolsa Chica is rotating in the oil sand at 3,170 feet, while the latter's No. 23 Copeland is logging a well-saturated oil sand at 3,675 feet. The Biltmore Oil Co. has just brought in its No. 1 Pyne, flowing 505 bbls. daily from 4,194 feet, and this well, an offset to the Union Oil Co.'s No. 1 Mullin, a recent completion in the Richfield district doing 815 bbls. daily, should be followed into production by No. 1 Wyman of the Continental Oil Co., which is rotating in the oil sand at 4,195 feet. The Marland Oil Co., which finished four exceptionally favorable producers in the deep zone at Seal Beach during the past 30 days, will probably not be in position to make a bid for additional production in this district within 30 days, but the Standard Oil Co. will probably make up this deficiency by completing Nos. 10 and 15 on the San Gabriel lease in the deep zone, as both are in the oil sand at approximately 5,350 feet. The Texas Company's No. 1 Lovell, in the Alamitos Heights section of the Seal Beach Field, is also expected to be on production shortly, as this well is being reamed preparatory to being finished in the deep Wahl zone at 6,285 feet.

Ventura Avenue

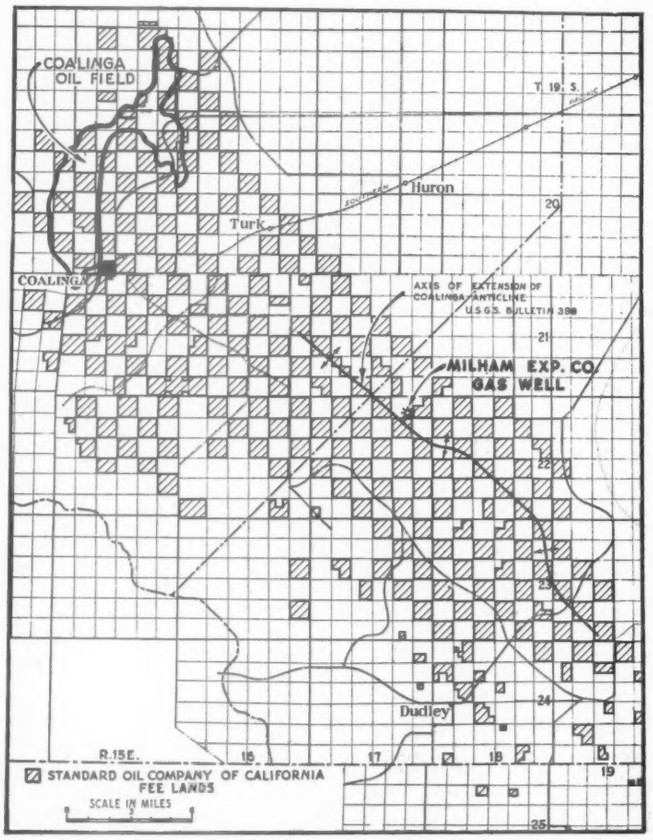
The Associated Oil Co.'s No. 11 Hartman, in the northeastern part of the Ventura Avenue Field, has failed to come up to expectations upon completion at 7,513 feet, as it has refused to result in a natural flow, notwithstanding it has been bailed and swabbed for several days. The failure to result in commercial production is probably due to mechanical conditions, as several hundred feet of good-looking oil sand had been opened up previous to completion, and the well gave every evidence of resulting in a natural flow. Corrective measures are already being undertaken, and this project may have become clogged up with heavy mud. The Shell and Petroleum Securities are also expected to finish new wells within 10 days, as both have several projects standing cemented above the oil sand. The city council of Ventura is considering the advisability of repealing an existing ordinance which prevents the drilling of oil wells within the corporate limits. It is not the intention to lift all restrictions entirely, as this move is being made primarily to facilitate drilling operations in the Ventura Avenue Field, part of which may ultimately be found to lie within restricted districts.

The Richfield Oil Co. expects to make a production test of its No. 1 Miley, a deep well, in the Rincon Field of Ventura County. It is the first and only conclusive deep test drilled within the limits of present production. The outlook is rather favorable, although the hole is not in as satisfactory condition as might be desired, due to mechanical difficulties. The Elmer Oil Co. has logged several favorable showings in its Rincon well at Muscle Rock, approximately 1 mile northwest of production, and while the oil sand found just above the 3,900-foot level is not of sufficient thickness or saturation to result in commercial production, these shallow indications are considered very favorable. Several drilling wells were started in the Muscle Rock area about six months ago, but practically all of this extension work was suspended when deep-zone development got under way at Santa Fe Springs. The Wilshire was the first to transfer its drilling crew from Rincon to Santa Fe Springs, but the Italo Petroleum Co., Bankline interests and others followed within a short time.

Midway-Sunset

The Republic Petroleum recompleted its deep-zone discovery, No. 25, in Section 8-32-23, in the Midway-Sunset Field of Kern County, doing 1,225 bbls. daily after cleaning and washing out the hole to bottom, 2,750 feet. The Italo Petroleum Co. is building rig for a new well

(Continued on Page 117)



Kettleman Hills area and Coalinga oil field. Axis of Coalinga anticline traversing Kettleman Hills also is indicated.

The illustration to the left shows the position of the block when stringing lines.

The "OILWELL" Spring Travelling Block

A modern block for heavy oil field work, with Alemite lubrication and Roller Bearings.

No spring hook is necessary as there is a spring attachment in the lower clevis.

Sheaves can be removed by pulling out the center pin without dismantling any other part of the block except removing the guards on blocks so equipped.

Made in two sizes—54-inch shell (length over-all 7 feet), and 66-inch shell (length over-all 9 feet 4 inches); and with triple, quadruple or quintuple sheaves. Also either with or without guards.

Complete information will be cheerfully furnished at any of our 100 Branches

OIL WELL SUPPLY CO.

WORLD'S OLDEST AND LARGEST MANUFACTURERS OF OIL FIELD EQUIPMENT

PITTSBURGH, U.S.A.

BRANCH STORES IN ALL OIL FIELDS

Eastern Conditions Best for Years

Efforts to Increase Production of Old Wells Stimulated by Recent Price Advances. Two Fair Producers Completed

By D. S. Wakenight
Staff Correspondent, Eastern Fields

PITTSBURGH, Pa., Nov. 19.—The recent price advances are accounted for by the growing scarcity of crude of the Pennsylvania grade. Without waiting for the market to reach the desired point where operators claim it is high enough to start new work many within the past few months have been making an effort to increase their production by trying to make the old wells produce a little more and their efforts have been to a degree successful. If the average increase of the old wells is less than one-half barrel it will amount to considerable in the aggregate. In the absence of new and undeveloped territory the eastern operator has no other recourse. However, the industry in the East is in a better condition than it has been for many years.

The refiners are taking all of the Pennsylvania grade of crude that can be had and some claim they cannot get enough to meet their requirements.

Two Fair Producers

But two fair producers were completed just at the close of the week. The better is Perry Sturm & Co.'s No. 4 on the Woodrow heirs' farm, in the NE of Section 23, Green Township, Hocking County. The well produced 100 bbls. the first 24 hours after shot in the Clinton sand. In the NE of Fallsbury Township, Licking County, the W & M. Oil Co.'s test on the J. W. Little farm produced 75 bbls. the first 24 hours after completed and shot in the same formation.

In the SE of Section 5, Cross Creek Township, Jefferson County, Palmer & Co.'s No. 3 on the Joseph Stroud farm is a very light pumper in the Berea grit. On Good Hope Ridge, Salem Township, Washington County, Meister & Blair have completed No. 3 on the Meister-Blair farm. They are bailing 10 bbls. a day from the Mackburg 500-foot sand.

In the Fisher Pool, Lot 82, Athens Township, Athens County, Gross and others have completed a test on the Loy W. Bartlett farm. It is a gasser in the Berea grit good for 1,500,000 feet. In Independence Township, Section 33, Washington County, Schramm & Co. have started to drill on the J. H. Ward farm. In Section 16, Elk Township, Noble County, Thurman Springer and others are rigging up to drill a test on the S. W. Ayers farm.

In Section 15, Perry Township, Licking County, the Preston Oil Co. has completed No. 8 on the James C. Wright farm. It produced 12 bbls. the first 24 hours after completed and shot in the Clinton sand.

In the NE Section 12, Sutton Township, Meigs County, the Wehrle company has completed in the Berea grit a test on the Willie B. Cross farm. It is producing considerable salt water and a little oil.

Muskingum Gasser

In Section 15, Muskingum Township, Muskingum County, J. F. Bebout and others have completed a test on the Lula Shaw farm. It is a fair gasser in the Clinton sand. In Falls Township, L. W. Luther has a gasser at a test on the F. E. Ruhla farm. In the same township, Hunter & Athey have a duster on the William Tannehill farm.

In Section 8, Bethel Township, Monroe County, F. O. Parks & Co. have a 5-bbl. pumper in the Germantown sand at No. 3 on the Lena Nieb farm. In Section 22, Reading Township, Perry County, the Kemrow company has a duster in the Clinton sand at a test on the Frank Flowers farm.

In Bowling Green Township, Licking County, the Ohio Fuel Supply Co.'s test on the Catherine Hupp farm, dry in the Berea grit, is now drilling to the Clinton sand. In the same township, the same company is due in the sand at a test on the J. H. Cooperrider farm. In Section 21 Hopewell Township, the Witmer Oil & Gas Co. is due in the Clinton sand at a test on the Jacob Curry farm.

In Section 30, Green Township, Hocking County, the Griffin Producing Co. has a gasser good for 2,000,000 feet at a test on the Abraham Mohler farm. In the same section, the same company has rigs up for tests on the J. W. Geiger and Gideon Lowe farms. In Ward Township, the Preston Oil Co. is drilling on the Sunday Creek Coal Co.'s property.

Guernsey County

In Section 13, Cambridge Township, Guernsey County, John McCarton and others have a 10-bbl. pumper on the C. O. Matson farm. In the same township, Dr. C. L. Craig and others have a 5-bbl. pumper on the Thomas heirs' farm. John Matson & Co. have a rig completed on the L. I. Gable farm.

In Paint Township, Holmes County, the Ohio Fuel Gas Co. has a Clinton sand gasser at a test on the Daniel G. Weaver farm. In Clarke Township, Coshocton County, the Ohio Oil Co. and the Pure Oil Co. have rigs up for tests on the Robert Rhodes and Howard Mohler farms. In Section 6, Knox Township, Columbiana County, Wilbur Yeagley has a duster in the Berea grit at a test on the J. Yeagley farm.

In the northeast quarter of Section 15, Bowling Green Township, Licking County, the Pure Oil Co. completed and shot in the Clinton sand a test on the Joseph Phillips farm. It produced 30 bbls. the first 24 hours. In Lot 10, Hardy Township, Holmes County, the East Ohio Gas Co. completed and shot in the same formation No. 7 on the J. R. Forgy farm. It produced 20 bbls. the first 24 hours.

Light Well in Fairfield County

In the northeast quarter of Section 26, Rush Creek Township, Fairfield County, the Rubin Oil Co. and others have completed in the Clinton sand No. 3 on the M. F. Whitehill farm. It is a very light pumper. On the Little Muskingum River, Ludlow Township, Washington County, Homer Newhart and others have completed a test on the Samuel Nixon farm. It is a 5-bbl. pumper in the Berea grit and has a gas pressure good for 200,000 feet.

In the northwest quarter of Section 21, Ward Township, Hocking County, the Kachelmacher estate's test on the J. Carson farm is good for not more than 5 bbls. a day in the Clinton sand. In Section 13, Liberty Township, Washington County, William Huntsman and others have started to drill a test on the John M. King farm.

West Virginia

On Paw Paw Creek, Paw Paw district, Marion County, West Virginia, Victor Tennant has completed a test on his own farm, a fair gasser in the Big Injun sand. In Washington district, Pleasants County, J. C. Dinsmoor and others have drilled No. 16 on the J. E. Barrett farm through the Cow Run sand and dry.

On Buck Run of Sandy Creek, Ravenwood district, Jackson County, the South Penn Oil Co. has the rig completed for a test on the C. S. McCarty farm. The location is 1,000 feet south of the Heck Oil Co.'s test on the George Kuhl heirs' farm.

On Elk River, Big Sandy district, Kanawha County, the United Fuel Gas Co. has completed in the Weir sand a test on the King Land Co. tract. It is a gasser good for 6,000,000 feet. The location is 2,500 feet south of the same company's test on the M. A. Cobb farm and is the best producer completed in Kanawha County in many months.

In Union district, Tyler County, Hess & Co. have completed a gasser at a test on the Homer Hess farm. In Carroll district, Lincoln County, L. R. Sweetland has a gasser in the Berea grit at No. 37 on the L. T. Nida farm. In the same district, Meabon & Huffman have a gasser in the same formation at a test on the J. N. McClenahan farm.

Cabell County

In McComas district, Cabell County, the Ohio Fuel Oil Co. has a duster at a total depth of 3,400 feet at a test on the J. L. McCoy farm. In Webster district, Marshall County, Frye & McCracken's No. 1 on the W. L. Donan farm, drilled down to the Gordon sand, is a duster. In Sherman district, Calhoun County, W. S. Dailey & Co. have the rig completed for a test on the Fremont Poling farm.

On the Kanawha River, Center district, Calhoun County, the Louis Flannigan & Goff Gas Co. completed in the Big Injun sand No. 3 on the Allen Smith farm, a gasser good for 1,200,000 feet.

In Union district, Clay County, the Hamilton Gas Co. has rig completed for a test on the B. W. Mullins farm. On Willow Island Run, McKim district, Pleasants County, the South Penn Oil Co. has moved a drilling machine to another location on the D. W. and I. Reynolds farm.

In Murphy district, Ritchie County, the Reno Oil Co. got a light gasser at No. 3 on the M. F. Cunningham farm, in the Maxon sand. In Grant district, the Big Four Drilling Co. has a duster in the Squaw sand at a test on the Elizabeth Ayers heirs' farm. It has been abandoned.

In Clay district, Ritchie County, Bachelor & Co. have a 10-bbl. pumper at a second test on the Jacob McCullough farm. In Otter district, Braxton County, the Union Oil Co. has completed a test on the J. L. Eubanks farm and is a gasser in the Big Injun sand. In Geary district, Roane County, Richard Elkins and others have a Big Injun gasser at a test on the J. M. Keene farm.

Gas Pressure Increased Production

In Grant district, Ritchie County, Hennegan & Hanlon have put Nos. 4, 11 and 13 on the P. R. Tharp and No. 4 on the Margaret E. Moroton farms under gas pressure and materially increased their production.

Three out of four late completions in the West Virginia fields are dusters. In Green district, Wetzel County, the Continental Oil Co. completed a test on the G. M. Schamp farm, dry in the Big Injun sand. In the same district and county, the Maple Oil & Gas Co. had the

(Continued on Page 106)

IN EASTERN OHIO COUNTY, KENTUCKY, SUNNYDALE FIELD HAS 150-BBL. WELL

By Whit
Staff Correspondent, Kentucky-Tennessee

OWENSBORO, Ky. Nov. 19.—One of the most important oil completions for the week was made on the R. A. Duke farm, in the Sunnydale Field with an initial of 150 bbls., one of the best producers yet found in that particular area, which will bring about a more active development in the shallow sand, in the eastern part of Ohio County. A nice gas well was also found on the Griffith lease, near Dundee, same county, and a well on the Riddle lease in the Red Hill District of Daviess County is said to show a heavy pressure of gas, in the Jackson sand but may be drilled down for the oil pay.

The Producers Pipe Line Co. has completed its extension from Taffey Station in Ohio County, to the Red Hill District in Daviess County, a distance of 10 miles where it will start gathering oil at once. The completion of this extension gives the company approximately 31 miles of main line. The line is principally owned by James C. Ellis of Owensboro, who has completed more than 100 wells in the Ohio County Field since his first drilling venture on the J. R. Weller 110-acre farm, in the Ambrose Pool.

Pipe Line Runs

During October the Illinois Pipe Line Co. run through its Western Kentucky lines a total of 228,850.82 bbls., or 22,471.75 bbls. more than for September. This company is connecting up new pools as rapidly as they are opened up, and usually does those things in a hurry. This company is laying a gathering line to the new Burton Pool, on the Hartford Road, near Lewis Store, in the south part of Daviess County, the pool being opened by Walter Daley and Jack Lowman, of Cleveland, Ohio. The wells so far found in the Burton Pool, are not large producers like those in the Ambrose, Brown and Hayden Pools, but are good average producers.

Week's Work

A summary of the week's work in the Kentucky fields show 33 completions, 22 producers with an initial production of 360 bbls., 10 dry holes and 1 gas well.

County—	Comp.	Oil wells	Prod.	Dry	Gas
Ohio	13	8	360	4	1
Barren	11	8	40	3	0
Daviess	5	3	15	2	0
Warren	2	2	3	0	0
Simpson	1	1	2	0	0
Hancock	1	0	0	1	0
Total	33	22	360	10	1

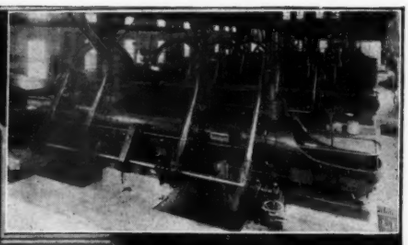
Ohio County Wells

Ohio County's best completion was the Wood Oil Co. Inc.'s No. 3 on the R. A. Duke 200 acres, in the Sunnydale Field, which came in as an initial producer of 150 bbls. at the shallow depth of 462 feet. In this well a string of 351 feet of 8¼-inch pipe was set, then a string of 400 feet of 6-inch. Top of sand was at 430 feet and bottom at 452 feet, total depth 462 feet. This well attracts considerable attention owing to its big production, for nothing of the kind was looked for and it makes the Sunnydale territory stack up with some of the other productive pools in the county. Same company drilled in No. 1 on the J. T. Griffith, same county, estimated at 1,000,000 feet of gas. This is near Friendship Chapel, and was drilled for gas, as it is expected to supply a quantity of gas to Owensboro when the pipe line is laid into the city. Same company drilled a dry hole at a depth of 675 feet on the Charles McKinley and others farm, in the Bell Run's area, northwest of the Ambrose Pool.

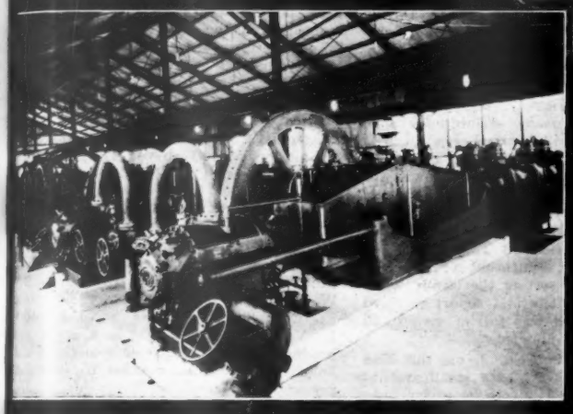
In the Whittaker Pool, between the Ambrose Pool and the King Pool, the

(Continued on Page 106)

nd OIL
rtation
Coopers



1. Columbia Gas and Electric Company's Branchland, West Virginia, natural gas compressor station contains eight Cooper 500 H.P. single-tandem gas engines. The first two have been operating since 1913.

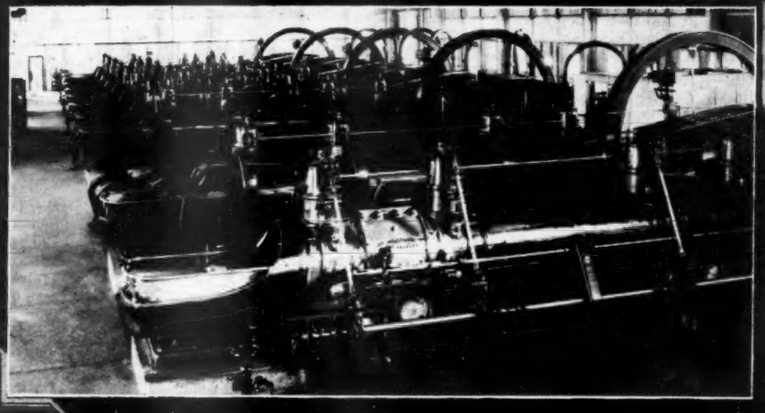


2. Six 1000 H.P. Cooper double-acting twin-tandem gas engines in Houston Pipe Line Company's Edna, Texas, natural gas compressor station.

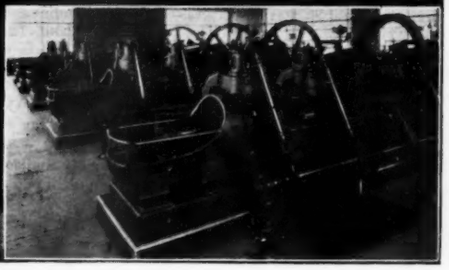
3. Midway Gas Company's Taft, California, natural gas compressor station contains four Cooper 1000 H.P. and three 500 H.P. gas engines.

4. Cities Service Gas Company's Mooreland, Oklahoma, natural gas compressor station contains four Cooper 1000 H.P. twin-tandem gas engines.

5. Ohio Fuel Gas Company's York natural gas compressor station near Medina, Ohio, contains five Cooper 500 H.P. single-tandem engines.



6. Cooper-M.A.N. airless injection 165 B.H.P. Diesel oil engine, driving electric generator. These are built in standard sizes up to 340 H.P. for driving oil line pumps and every power purpose.



o., Mt. Vernon, Ohio
Angeles Kennedy Bldg., Tulsa

Catawba Island Has Good Gas Well

Central Ohio Field Maintains Its Activity With 25 Completions, 21 New Locations and 23 New Wells Started

By Whit
Staff Correspondent, Central West Fields

FINDLAY, Ohio, Nov. 19.—An important find was made in the old Lima Field of northwestern Ohio when the Catawba Oil & Gas Co. drilled in a test on the C. M. Seegur property, Section 24, Catawba Township, Ottawa County, east of Port Clinton, the county seat. This well is 60 feet from the north line and 200 from the south line of the lease, in the SW of the section, which is on Catawba Island. Top of Trenton was found at 1,887 feet and was drilled 101 feet into the sand to a total depth of 1,988 feet, making 500,000 feet of gas. This is a very valuable find, if the gas will hold up, for it will be sufficient to supply all residents of the island with fuel and possibly Lakeside, the well-known summer resort. Other tests are to be made and if gas can be found as good as the Seegur well it will mean much for that end of the county. In the southern part of the Lima Field, the Eilerman Oil Co. drilled a test in the NE cor. of the Jacob Batty farm, in the NW of Section 3, Laramie Township, Shelby County, southwest of Lima. Sand was topped at 1,215 feet and drilled into the sand 40 feet, where salt water was found, and the hole given up as a failure.

The Tiffin Field, which has been the active area in the Lima Field, shows no new wells in and but few drilling. This is in Liberty Township, Seneca County. As far as can be figured, there are but a few more locations to drill in the defined limits of the Murphy Pool, although the finding of a 100-bbl. initial producer a couple of weeks ago on the August Fleckner farm, some distance east of production, may mean an extension in that direction. The Fleckner well was drilled by Marshall Brothers on what is known as the old A. Skranswefky in Section 27. No. 2 has been started on the same farm.

Indiana Field

The only oil completion reported from Indiana was William Bell and others' test on the E. and S. Ewing farm, Section 1, Washington Township, Gibson County, good for 10 bbls. at 1,793 feet. Same parties are nearing sand at No. 2 on the Ira Seifers, same section, also on No. 3 on the Frank Thompson, Section 6, same township.

The A. S. Bement Gas Co. is drilling a test on the J. M. Davidson farm, Lot 12, Clay Township, Pike County.

Near Pendleton, in Fall Creek Township, Madison County, the Pendleton Natural Gas Co. drilled two wells on the State Reformatory land, one being a dry hole and the other a light gas well.

In Boone Township, Harrison County, the Laconia Fuel & By-Products Co. brought in a fair gas well on the Harvey Conrads farm, east of Tobacco Landing, Section 28, and a better gasser on the Keith farm, same area, the gas being found in the Albany shale formation.

The water well drilled by the Mich-Indiana Oil & Gas Co. on the Bennett Taylor 160 acres in the SW Section 17, Salem Township, Pulaski County, has given that area a setback, for it has the structure and everything favorable, but fresh water was found in the Trenton at a comparatively shallow depth, and this fresh water has eventually driven the oil to the apex of the structure. The Niagara lime above the Trenton was also found to contain water, and the only thing that can account for this water proposition is that former wells were not properly plugged and were drilled before the stringent laws of Indiana were made on the plugging of wells.

Indiana Oil and Gas News

Compiled by T. M. Kingsbury, state gas supervisor, Department of Conservation, Division of Geology, Indianapolis, Ind.

Adams County — George Lacknet brought in what is reported to be a good producer on the S. C. Tinkham farm, Blue Creek Township, in new territory. The well was finished at 1,100 feet and produced some gas. Plans have been made to move the rig on the John Clauser farm, which adjoins the Tinkham farm.

Crawford County—The well being drilled by Henderson Brothers on the D. W. Jones farm, Section 30, Johnson Township, southeast of Birdseye, was temporarily abandoned, but is now being drilled deeper. Last reports state it is 1,380 feet down. In the southern part of the county near Alton on the D. S. Gaither farm, Section 28, Boone Township, Pfeffer, Mason & Chanley are drilling at about 700 feet. They have encountered some oil but have not been able to case off the water to determine the amount.

Gibson County — The Roxana Petroleum Corp. has started No. 2 on the Manford Corn farm, Section 15, Columbia Township, about 3 miles west of Oakland City. No. 1 well on this farm produced a strong flow of gas and at 1,422 feet encountered oil, the initial production being 30 bbls. Bell Brothers got a 10-bbl. well on the E. & S. Ewing farm, M. D. 78, Washington Township, at 1,793 feet. They are drilling on the Frank Thompson farm, and the Ira Seifers farm, both in Section 1 same township. In Barton Township, Section 17, they are drilling on the H. Shumacher farm. The Seifers well, which is 1,525 feet deep, encountered some oil at 1,363 feet down. Randall & Rogers have also started a well in Barton Township on the John Williams farm, Section 5.

Greene County—No report has been received from the well started last month on the Ad. Wright farm, southwest of Linton.

Harrison County—T. J. Heaton, manager of the Laconia Fuel & Bi-Products Co., reports one of the biggest gas wells ever drilled in this county on the Keith farm, in the southern part of the county. This well went through the New Albany shale, in which gas is found in all of the other wells of the county and encountered the high pressure in the top of the Corniferous. This company completed its first well last month on the Alonzo Brown farm, Section 27, Boone Township. Its second well, completed since the last report, is on the Harvey Conrads farm, Section 28, same township, and was reported as a 200,000-foot well with pressure at 61 pounds. The Southern Indiana Utilities Corp., which has drilled about 12 good wells in the county this year, is drilling some of its wells in the southern part of the field through the shale to test the limestone.

Jay County—Dee Wesner has a well nearing completion on the Oscar Current farm near Red Key.

Madison County—Two gas wells were drilled on the State Reformatory grounds near Pendleton. No. 1 produced a good flow of gas, but No. 2 was plugged.

Monroe County—No report has been received on the progress of the well being drilled by the Saddle Creek Oil Co. on the John Fox farm in the southern part of the county.

Pike County Tests

Pike County—It is reported that a well was started October 1 by the Bement Gas Co., on the Jasper N. Davidson farm, in Clay Township. H. C. Darby and others are drilling a well on the Fannie Fowler farm, Section 26, Logan Township. This well is down 750 feet. The test well being drilled by Perry Andrews on the Dave P. Wurtz, farm, in Washington Township, encountered Blue Lick water at 1,545 feet and was plugged. The Gem Oil Co.'s shallow well on the A. Yager farm, Section 9, Monroe Township, produced a 48-pound gas well at 249 feet.

Pulaski County—The test well being drilled by the Michigan-Indiana Oil & Gas Co., on the Bennett Taylor farm, in Salem Township, southeast of Francisville had trouble setting the casing when down 600 feet. The last report received was that the well was full of water and would have to be plugged.

Spencer County—No. 1 on the Ban Richardson farm showed a small amount of gas, but turned out to be a dry hole. No word has been received from the well planned by the Universal Oil Co. to be drilled northeast of its last well on the Forest Bell farm, Section 20, Clay Township. Neither has any further report been had concerning the well being drilled by Orville Martin on the James Martin farm, 1½ miles north of the well recently completed by George Elliott on the J. G. Hines farm, west of Rockport.

Sullivan County—Plans are being made to drill a deep test well on the Brewer farm on the Halberstadt lease southwest of the Siosi Pool. J. F. Bollinger and others are drilling a well on the J. Harris farm, in Section 2. They are at present down 1,200 feet. Wyman & Brown are drilling Mayfield No. 2 in Section 5, Fairbanks Township. They are down 500 feet on this well. In the same township, Charles W. Scott and others are planning to drill Charles W. Scott well No. 2 in Section 6.

Vanderburg County—Trusler & Ventz are down 808 feet on their well being drilled on the George Kraft farm, Section 3, Armstrong Township. L. A. Martin company are down 1,165 feet in their test well on the John Wills farm, Section 32.

Vigo County—The Siosi Oil Co. is drilling No. 18 on the William Riggs farm, Lease 38/40.

Warrick County—The test well being drilled by Folsom and others on the John Scales farm, 3 miles west of the Gentryville Pool, reported hole full of water at 1,340 feet. The Prairie Oil & Gas Co. plans to drill this deeper.

Mr. Kingsbury further says: "This office will be glad to co-operate with operators in any way possible in supplying information on geological conditions in various parts of the State. One publication of this Division gives some information on each county, includes a small geological map of the State and contains the logs of about 1,500 wells. It is a special publication obtainable through this office for $1. We also have a report, Geological Conditions in the Oil Fields of Southwestern Indiana, which gives more detailed information about that part of the State than the first report mentioned. For people living in the State, this report sells for 50 cents and 75 cents for those living elsewhere.

"Please send us copies of logs of all wells you drill in Indiana. This is required by a department regulation. We should appreciate information on wells that are being drilled, giving location, owner of farm, and by whom they are drilled. Report leaking or abandoned wells, also."

Central Ohio

The Central Ohio Field maintains its activity in development work that has been noticeable for the past couple of months, and the field shows a total of 25 completions, 5 dry holes, 11 gas wells, and 9 producing wells with an initial production of 102 bbls.; 21 new locations staked out, and 23 new wells started drilling.

Ashland County leads in the number of completions. In Hanover Township, the Ohio Fuel Gas Co.'s No. 2-3,161 on the Johnson-Barnes farm, Section 20, was a dry hole. In Greene Township, the Logan Gas Co.'s No. 2-3,026 on the Walter C. Workman farm, Section 20, is a light gas well. In Orange Township, the Ohio Fuel Gas Co.'s No. 1-3,295 on the W. P. Welch farm, Section 1, is a fair gas well. The Kemrow Co.'s No. 1 Edgar L. Vemilia, Section 22, is a good gas producer and the same company's No. 2 John T. Fluke farm, Section 15, is a fair gasser. In Vermillion Township, a dry hole was drilled by the Ohio Fuel Gas Co. in No. 1-3,276 on the Dwight Donelson, Section 24. I. D. Hendershot's test on the John S. Moffett, Section 30, shows for around a barrel of oil at from 780-975 feet. In Perry Township, Robinson and others' No. 7 on the W. E. Strine, Section 20, is a 15-bbl. initial producer, and the same firm is drilling No. 5 on the Eliza Devault, same section.

In Medina County, Chatham Township, the Oko Oil & Gas Co. of Lima, Ohio, drilled in No. 18 on the G. W. Brinker Lot 6, Section 16, which pumped 10 bbls. initial. In Hinckley Township, Hulse & Kundtz have a location for a test on the Barbara Hess, Lot 51. The Ohio Fuel Gas Co. is drilling No. 1-3,33[illegible] on the L. G. Collister, Lot 25 and made a location for No. 1-3,368 on the Harry A. Redmond, Lots 56 and 65. In Lafayette Township, the Logan Gas Co. is drilling No. 5-3,051 on the Medina County Infirmary farm, Section 2.

In Lorain County, Carlysle Township, the Logan Gas Co. is drilling No. 1-3,06[illegible] on the Joseph Malik, Section 19.

Wayne County

In Wayne County, Congress Township, Harmon & George are drilling a test on the Doctor Biddle farm, Section 7, and the Logan Gas Co. is driling No. 2-3,0[illegible] on the Joseph W. Troxel, Section [illegible] Chester Township.

In Holmes County, Knox Township, I. E. O'Hail struck an average sized gas well at a test on the P. M. Young farm, Section 16. Ohio Fuel Gas Co. made a location for a test on the Thomas Hoo[illegible] farm, in Sections 13-18 Hardy Township.

In the Cleveland Field, Cuyahoga County, John Arthur's second test on the George Biddulph, Lot 27, Olmsted Township, was a dry hole.

In Knox County, Brown Township, E. Faulkner's No. 1 on the C. W. Wo[illegible] man, Section 21, looks good for 250,0[illegible] feet of gas. Ohio Fuel Gas Co. made a location for No. 1-3,369 on the J. E. A[illegible] Mox farm, Section 19, same township. In Jackson Township, Jameson Leighton made a location for a second test on the Charles W. Davidson farm, Section 2[illegible] Harry Perkins made a location for a test on the James Griffin, Section 1[illegible] Howard Township, same county.

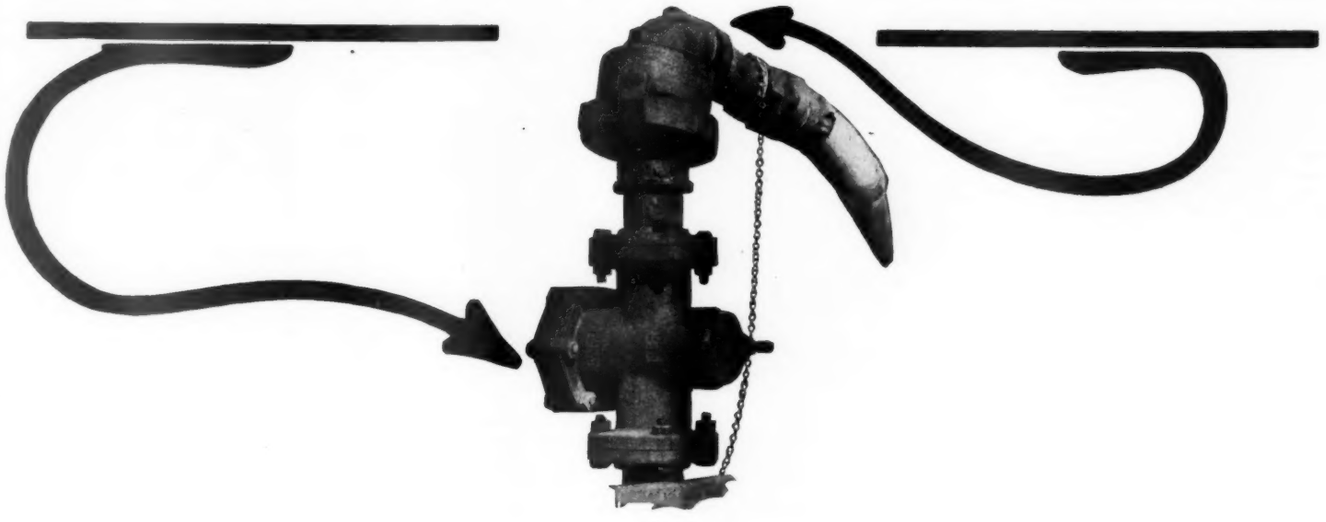
Dillon & McFrederick are starting No. 3 on the G. Beriswell, Lot 49, Strongsville Township, Cuyahoga County.

In Coshocton County, the Leonard O[illegible]

(Continued on Page 104)

BARCO

Valves and Joints



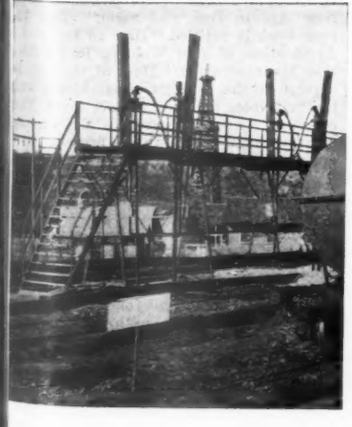
A winning combination on any loading rack

Valves

That won't spurt—that keep maintenance costs low—that outlast a dozen ordinary valves.

Joints

That move freely in any direction—that don't leak—that require very little attention.



BARCO

Manufacturing Company

1801 Winnemac Avenue,
Chicago, Illinois

Agents:
Vinson-Canter Co., Tulsa, Oklahoma
M. N. Dannenbaum Co., Houston, Texas

O&GJ 11-22 Gray

EQUIPMENT AND SUPPLIES

COOPER COMPANY HAS INTERESTING HISTORY

The C. & G. Cooper Co., Mt. Vernon, Ohio, which began its commercial existence in 1833, is sending out an attractive 24-page booklet, "95 Years of Engine Building." The booklet not only tells the story of how this company, starting out with one crude iron furnace, has developed into one of the country's leading manufacturers of gas engines and compressors, but it touches interestingly upon the policies which have carried the company forward through the years. It presents the human side of a great industrial organization in which employer and employe have been brought into sympathetic contact to an extraordinary degree, resulting in low labor turnover and high morale.

"We have tried to build up an industrial democracy," B. B. Williams, president of the company, says. It is the expressed belief of the officers and directors of the company that its prompt scrapping of old methods as soon as better ones are found, along with its ability to retain for long periods of years men who have become experts in their various departments, inevitably maintains a standard for its products unattainable under other conditions. The company recently acquired the manufacturing division of the Hope Engineering Co., Mt. Vernon, and will continue manufacture of the vertical type engines hitherto made by the Hope company.

TRADE LITERATURE RECEIVED

A new catalog issued by the Emsco Derrick & Equipment Co., Los Angeles, Calif., is of the loose-leaf type. Practically all the Emsco products are shown. The cover is of heavy leather-finish fabrikoid.

Several articles of special interest to oil men are presented in the current issue of Fusion Facts, published by the Stoody Co., Whittier, Calif.

The Trimont Manufacturing Co., Boston, Mass., is sending out a catalog of Trimo tools, including pipe wrenches, pipe cutters, pipe vises and parts.

The American Blower Corp., Detroit, Mich., has issued a new bulletin on Sirocco unit heaters for floor and ceiling applications.

A revised edition of a bulletin describing and illustrating Connersville meters has just been published by the Connersville Blower Co., Connersville, Ind. It contains a history of the double impeller type of blower or pump and of the rotary displacement meter.

"Distributing Petroleum Products" is among interesting articles in the November issue of the International Trail, published by the International Harvester Co. of America.

The Wagner Electric Corp., St. Louis, Mo., has just issued a bulletin describing Wagner large RA single-phase repulsion-inductor motors. Detailed descriptions make clear what each part of the motor is made for and why it is made that way.

"Houghto-Clean" is the title of a 36-page booklet issued by E. F. Houghton & Co., Philadelphia, describing the use of a series of cleaning materials manufactured by this company.

The California Manufacturing & Engineering Co., Los Angeles, Calif., is sending out a bulletin describing Calmec products, which include drill-pipe spiders, tubing spiders, crown blocks, casing protectors and other oil field equipment.

Catalog No. 85 of the Kewanee Boiler Corp., Kewanee, Ill., describes and illustrates the steel-riveted firebox boilers manufactured by this company. Specifications, blue prints and cross-section views are given.

NEW MATERIAL INCREASES EFFICIENCY OF BELTING

"Pulleystone" is the name of a new material which, according to the manufacturer, the Chicago Belting Co., Chicago, when applied to the surface of iron, wood or steel pulleys, will give them an efficiency equal to or even better than that of a new paper pulley. This new material is applied to the small pulley of

producing machines and to motor pulleys.

Applied to a large engine lathe pulleystone practically doubled the cut and doubled the machine's output. Applied to a large iron planer in the same plant it materially increased the output. Applied to a row of five coffee grinding machines it doubled the output of each of the machines.

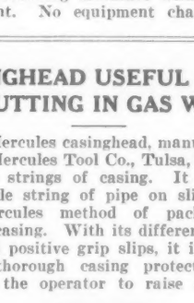
It is a device for increasing the output of producing machines with existing equipment. No equipment changes are required; according to the manufacturer it increases the output with all types of belting, leather, rubber, canvas, etc.

The increase in production output comes primarily from the elimination or reduction of belt slippage. When a belt-driven machine is new the drive (with leather belts) has an efficiency of 98 per cent or higher. But as bearings, belts, etc., wear or as the speed of machine or load is increased beyond what the equipment was purchased to do, slippage develops.

Pulleystone is a plastic material that comes only in 20-pound cans. It is spread over the pulley with the hand and is then smoothed off with the back of the hand dipped in warm water. The surface is then smooth enough to give a very high adhesion. This adhesion increases with service.

CASINGHEAD USEFUL FOR SHUTTING IN GAS WELLS

The Hercules casinghead, manufactured by the Hercules Tool Co., Tulsa, has slips for two strings of casing. It supports the inside string of pipe on slips using the Hercules method of packing off around casing. With its different principles and positive grip slips, it is said to afford thorough casing protection. It permits the operator to raise or lower



the casing at will by removing the packing nut, packing and slips. The casinghead can be repacked at any time without picking up the casing.

The inside diameter of the casinghead is the same size as the larger string of casing on which the casinghead is set up. Either three or four slips, depending on size, are used within the casinghead to support the inside string of casing. On top of the slips and within the casinghead space has been provided for the rubber packing. This packer is compressed down into the casinghead, and chain tongs, which are always on hand, are the only tools necessary to connect the entire setup. The casinghead is provided with two side outlets threaded for either 2-inch or 3-inch pipe.

The Hercules casinghead is especially adapted to shutting in wells having a great volume of gas. The casinghead can be made up on the inside string of casing on the derrick floor by placing the body over the top joint and inserting the slips, then the packing rings and packing nut. The nut is screwed down until it begins to compress the packing, then the casinghead is forced down into place with the tools and set up on outside string in the usual way and the packing nut is tightened. The slips in the casinghead are said to prevent the gas pressure from blowing the casinghead back.

NEW WELDING ROD DEVELOPED

The research laboratories of the Lincoln Electric Co., Cleveland, Ohio, announces perfection of its most recent development, a welding electrode known as "Fleet-Weld." It has been found from tests recently conducted that, in general, the speed of welding has been doubled or trebled by use of the new rod.

The wide use of high-speed electrodes has been retarded in the past by the porosity resulting when the higher currents necessary for fast welding are used. The newly discovered rod, because of the highly specalized processes of its manufacture, is said to have overcome this difficulty.

BUSINESS NOTES

Joseph T. Ryerson & Son, Inc., with plants in Chicago, Milwaukee, St. Louis, Cleveland, Cincinnati, Boston, Buffalo and New York, have taken on the Millers Falls Co. line of portable electrical tools. The Ryerson company has handled high-grade electrical tools for years.

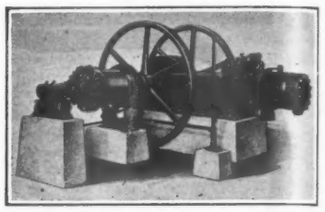
John A. Marr, for 10 years superintendent of the Nugent Steel Casting Co., Chicago, has been made works manager of the Chicago Steel Foundry Co.

L. S. Pitcher, who formerly represented the Pittsburgh Equitable Meter Co. in Texas, has taken over the northwest territory, including Washington, Oregon, Idaho and Montana.

BESSEMER ANNOUNCES ADDITIONAL ENGINES

The Bessemer Engine Co., of Grove City, Pa., has announced two new additions to its line of oil field engines—one a 50-horsepower two-cycle engine, the other a 55-60-horsepower four-cycle engine.

This new 50-horsepower two-cycle power plan embodies the characteristic features of the Bessemer type O.F. line, but in addition can be obtained with either Timken roller bearings or with the familiar poured babbitt shell bearings. The bed plate of this new 50-horsepower engine is designed not only to accommodate either type of bearing desired, but is so engineered as to make both types of bearings easily interchangeable in the field.



Bessemer 50-horsepower two-cycle oil field engine.

The other new addition is the 55-60-horsepower four-cycle oil field engine, embodying all of the advanced engineering features of the smaller horsepower four-cycle Bessemers. These features, with which many oil men are familiar, include enclosed type bed plate with straight-line wall construction; nickel-chrominum iron-steel cylinders outside bolted to bed plate with cylinder skirt extending into bed plate extension; oversize, overstrength rods, bearings and bushings; adjustable crosshead; simple valve mechanism consisting of valves mounted in cages on power cylinder, operated by roller bearing lay-shaft driven by spiral gears; improved Bessemer fly-ball, roller bearing governor; and overstrength construction throughout with precision machining on all parts.

The newest development in this larger size engine is the use of Timken roller main bearings when so desired. These engines are built both with roller bearings and with poured babbitt shell bearings, being furnished with either type which may be desired by the purchaser.

SUPPLEMENTS TEXTBOOK

The Lincoln Electric Co., Cleveland, Ohio, has published a supplement to its 160-page textbook, "Arc Welding—The New Age in Iron and Steel." This 32-page book is entitled, "How to Begin the Application of Arc Welding in Production Manufacturing." Most of the text is devoted to the redesign of machinery and the principles involved are set forth. The company plans to distribute the supplement without charge to all present owners of the parent textbook.

O'NEIL MADE VICE PRESIDENT

F. Edward O'Neil has been made vice president of the Fulton Iron Works Co., St. Louis, Mo., and manager of its Diesel division. He will have charge of the company's Diesel and gas engine business. Mr. O'Neill has been with the company since 1905 and for 11 years has been in charge of the New York office. He was in charge of the company's shops in 1909, when the company built its first Diesel engine, and for 19 years has participated in the development of the Fulton Diesel engine.

Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

COUNTER-BALANCING WELLS

Can you tell me the principal methods of counter-balancing pumping wells and the relative merits of each method? How do you determine the proper counter-weight for a well pumping on the beam?—R. O. B.

In the Mid-Continent fields grasshopper, straight-lift and rotating counter-balances are in use. A rough formula for estimating the proper counter-balance to use is this: Counter-balance should equal the weight of rods plus one-half the weight of fluid to top of plunger in pump.

H. N. Marsh in his paper entitled "Deep Well Pumping in California" presents facts which answer your question more in detail. Mr. Marsh's paper was read before the American Institute of Mining and Metallurgical Engineers meeting in Tulsa in October, 1928. He says:

"There are several forms of counter-balance in use. Most common of these is the well-known concrete block hanging from the walking beam, and guided either by a lever or by sliding on pipes. If hung from the beam between the pitman and Samson posts, the effectiveness of the weight is of course reduced by the ratio of the distance from center bearing to counter-weight line divided by the distance from center bearing to well line. If hung from a pony beam extending out beyond the pitman, the effective force is greater than the dead weight, but the travel of the weight is so increased that acceleration is excessive, causing the suspension cable to go slack at the top of the stroke, and the force to be so great at the bottom of the stroke that it is hard to make a pony beam strong enough to carry it. These arrangements are therefore not satisfactory for heavy wells with a fast stroke.

"So-called bandwheel counter-balances are in general use, comprising weights attached eccentrically to the bandwheel, with means for releasing or centralizing them while pulling the well. The effectiveness of such weights is dependent upon the length of crank stroke used, and the bandwheel diameter. With short strokes they are very efficient, and with 12-foot bandwheels they are satisfactory even for the longer strokes. The chief objection to these balances is that they put an undue load on bandwheel, shaft and crank pin, sometimes resulting in the failure of these parts.

"Several different counter-balances have been built and tried which lift up directly on the polish rod or the well end of the walking beam. These have been of the weighted lever, helical spring and pneumatic types. They are all inherently unsatisfactory, because, as previously pointed out, the correct amount of counterbalance is the mean between the force on the upstroke and the force on the down stroke, and if the effectiveness of a counter-balance in this position is made greater than the force on the down stroke, the rods will tend to lift off from the beam, or the beam will tend to lift up on the Samson post. In practice, these counter-balances can not have more than about 50 per cent of the desired effect.

"A counter-balance pitman is coming into use comprising a steel pitman to which is permanently attached a shelf on which cast iron slabs may be stacked. This arrangement has obvious advantages. The chief objection seems to be that there is no advantageous leverage ratio, so that the dead weight must equal the effective weight, which should often be 10,000 pounds or more. This results not only in high first cost, but in difficult handling.

"Counter-balance cranks are in use on several of the double reduction gears, and are also being tried on standard rigs. Some of them are very inadequate in amount, but a counter-balance of this type can certainly be made adequate on special units, and perhaps also on the standard rig. They may prove to be the best solution of the problem.

"Counter-balancing merits this relatively long discussion, because it is a problem not yet satisfactorily solved, and one whose solution is essential to the efficient operation of a pumping rig. Pumping of deep wells without some counter-balance is almost impossible, and changing from a slightly inadequate counter-balance to one of correct amount has been shown by repeated tests to result in power savings of 10 to 20 per cent."

Concerning the method of calculating the correct amount of counter-balance Mr. Marsh says:

"The theoretically correct amount of counter-balance can be easily calculated. Assume the load during the up stroke to be the net weight of the rods when submerged in oil, plus the force of the fluid on the total plunger area (not deducting for rod area). The weight on the down stroke is the net weight of rods when submerged in oil (oil is standing on the standing valve). The theoretically correct counter-balance is the mean between these calculated weights for up stroke and down stroke."

Mr. Marsh also presents a useful table for calculating the correct counter-balances for different well conditions.

For your further information upon this subject you are referred to United States Bureau of Mines Bulletin 224, "Surface Machinery and Methods for Oil Well Pumping" by H. C. George. You can obtain a copy of this bulletin from the Superintendent of Documents, Government Printing Office, Washington, D. C., at nominal cost.

RAINBOWS AND SALT DOMES

Is a strong rainbow on standing water in a swamp an indication of possible oil production underlying the swamp or is it caused by the action of some acid in the water working on the standing vegetation?

Is the topography of the soil surface in salt dome country where oil is being produced similar to the topography of the soil surface where oil is being produced and where no salt dome has been discovered or where no salt dome is known to exist?—J. G. A.

A strong rainbow on standing water in a swamp may or may not deserve consideration as a possible indication of an oil seepage. A rainbow film on water may be, and generally is, caused by iron oxide forming on the surface of the water. The first thing to do is to determine whether the rainbow is caused by a film of iron oxide or a film of oil and then if it is oil to determine the kind and possible source of the oil. If it is crude petroleum, if it is found in a petroliferous region, and if there is reasonable assurance that its occurrence is natural rather than artificial, then further investigation is warranted. Many oil fields have been revealed by first finding natural seepages of oil.

Salt dome topography in the Gulf Coast region of Texas and Louisiana is quite characteristic and distinctive. Slight rises above the flat Coastal plain country and sometimes erosional lakes or ponds over the top of a salt dome are characteristic. If you are interested in salt domes, you should refer to the volume on salt domes published by the American Association of Petroleum Geologists with offices in Tulsa.

WHERE WILL THEY DRILL?

I have in mind two questions that are not clear in my mind. May I submit them for reply?

1. I have within the last year leased my land in Woods County, Oklahoma, to the ——— Oil Co. for oil and gas. This is a 10-year lease.

Is there a likelihood that dry holes or abandoned wells drilled by other companies in the county, would cause the ——— company to drop their leases and make no decisive test on their own block? Or owing to the present cheapness of oil would they make a test well or wells and smother the results from the public, (that is, if they found oil keep it a secret, claim a dry hole, drop their leases to re-lease some time in the future when oil was scarce and a good price?) But again when they wanted to renew their leases would not the landowners suspect trickery, making it very hazardous for the oil company? Then too, there is the likelihood of a competing company bagging their game (getting possession of their leases.) I would like to get that matter clear in my mind.

2. Will oil companies in future prefer to drill on good prospects in foreign countries rather than drill on the doubtful ones at home? This is doubtless a problem in economics. The question would be which is the cheaper.—L. M.

With reference to your first question it can be said only that it is concerned primarily with the integrity and good faith of the oil company with which you are dealing. That is something that cannot be discussed here. It might be stated, however, that this office has no information reflecting on the fairness and honesty of the company you name, and further that reputable oil companies, like reputable concerns in other industries, are not accustomed to resort to trickery in their business dealings.

Your second question has apparently been answered, in part at least, by the foreign developments that many of the major oil companies are already conducting. They are developing the most favorable territory that is available to them. It is probable that in general the oil companies will continue to drill in the best available prospective territory in foreign countries as well as at home and that the less favorable territory at home will have to await its turn in the order of its merit from a prospective as well as economic point of view. You should remember, however, that territory considered unfavorable today may become the scene tomorrow of greatest activity. There are also the considerations of accessibility, transportation, pipe line facilities and expense. All of these influence the testing and development of any territory. As you say, it is largely a problem of economics.

CHEMICALS FOR PARAFFIN

We would like to obtain some information regarding the cleaning out of wells and freeing the sand of paraffin and other accumulations by the introduction into the casing of chemicals. We have been informed that there are certain compositions now on the market which are designed for this purpose, the theory being that after the chemical is first put into the well water is added and when the two combine a heating takes place which melts and removes the paraffin from the sand and holds it in a suspended condition for a considerable length of time enabling it to be easily pumped out through the tubing in the regular way.

We have a number of shallow wells, approximately 600 feet deep, producing a very high-grade oil which paraffins quite badly, and have been considering trying this method of treatment if it has been known to work successfully elsewhere.—W. M. S.

Chemicals have been used for a number of years for the removal of paraffin from oil wells but without enough success to bring them into general use. Sodium peroxide and mixtures of sodium hydroxide (caustic soda) and aluminum have been used most extensively. Both of these methods depend upon the generation of heat enough to melt the paraffin when the reagents come into contact with water.

Electric heaters would probably be more beneficial than chemicals.

Electric heaters should be beneficial in removing paraffin from tubing and rods and preventing its further deposition.

For your further information you are referred to the following publications of the United States Bureau of Mines which can be obtained at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C.:

"The Paraffin Problem in Oil Wells," by R. Van A. Mills. Reports of Investigations, Serial Number 2550, December, 1925.

"Methods and Tools for Removing Paraffin From Flowing Wells," by C. E. Reistle, Jr. Reports of Investigations, Serial Number 2802, April, 1927.

"Methods of Dealing With Paraffin Troubles Encountered in Producing Crude Oil," by C. E. Reistle, Jr. Technical Paper 414, 1928.

For further information upon the paraffin problem you might refer to Chapter 4, pages 227 to 284, of Petroleum Development and Technology in 1927, published by the American Institute of Mining and Metallurgical Engineers, New York. This book contains excellent papers and discussions upon the paraffin problem which should be helpful to any production man having trouble with paraffin.

FRANKLIN VALVELESS C

New! FRANKLIN

Type
2-SD

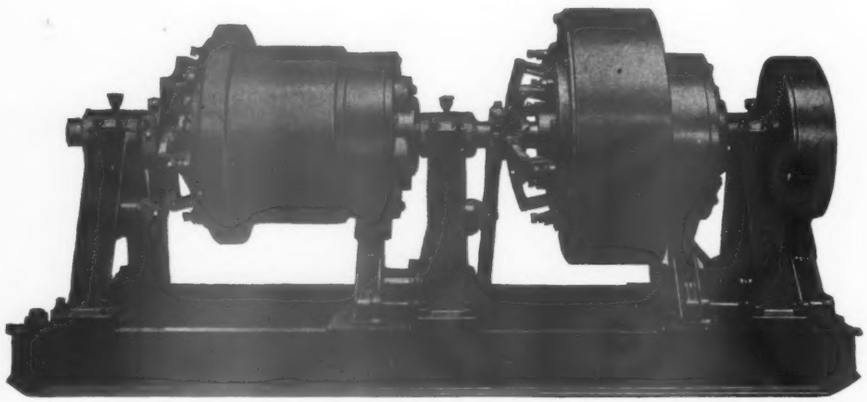
—*for Cable Tool or Rotary Drilling*

The new Franklin 2-SD Reverse Clutch is so designed and constructed that it is belt driven from a pulley on the engine—a radical departure from the usual method of being bolted to a flange on the fly wheel. It has two speeds in either forward or reverse motion. The changing of gears can be made at any time, regardless of speed or load, by simply operating a hand lever in the derrick. A neutral brake is controlled by the same hand lever used in reversing and is always set when this lever is in mid-position.

All of which make the 2-SD especially useful for cable tool or rotary drilling.

TYPE SD

This is exactly the same as the 2-SD except that a belt pulley or sprocket wheel is substituted for the two-speed arrangement.



FRANKLIN VALVELESS ENGINE CO.
Franklin, Penna.

Distrd By
OIL WELL SUP
Branches | O

OIL AND GAS ENGINES

Reverse Clutches

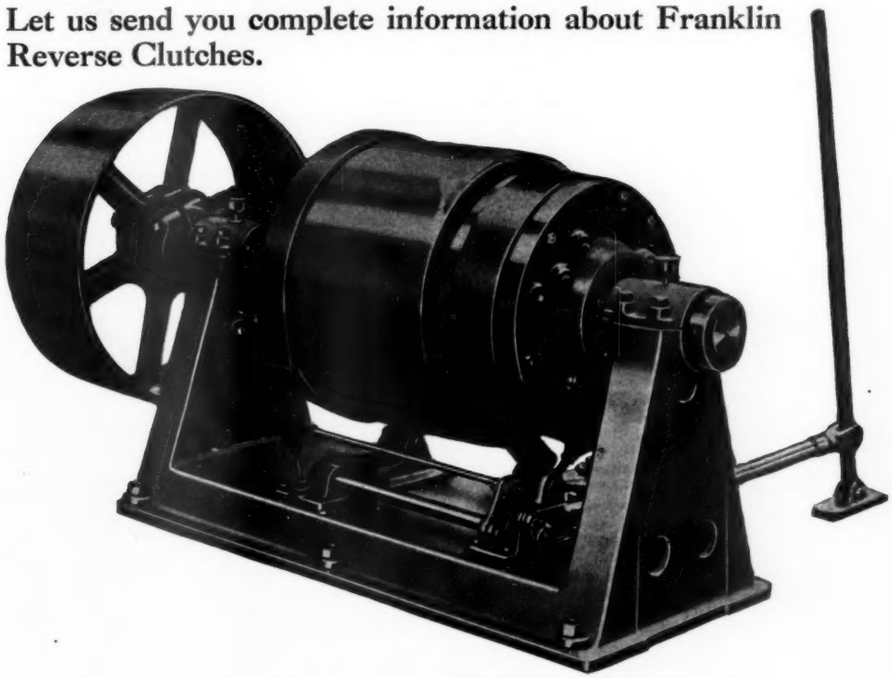
—for Cable Tool Drilling or Pumping

Type BG

The BG Clutch is practically the same as the 2-SD except that it is lighter and has only one speed in forward or reverse. It is a self-contained type whose construction prevents shaft breakage. It permits the use of a larger diameter pulley and makes possible a slower clutch speed. Even when placed at a new location, there's never any need for it to be taken apart and reassembled.

Such a clutch is particularly well adapted for cable tool drilling or pumping.

Let us send you complete information about Franklin Reverse Clutches.



FRANKLIN VALVELESS ENGINE CO.
Franklin, Penna.

By
PLY COMPANY
Oil Fields

Natural Gas Developments

Orders Reported Placed For Lines to St. Louis And Birmingham, Ala.

By B. E. V. Luty

PITTSBURGH, Pa., Nov. 19.—Quite a lot of line pipe for natural gas lines is being talked about in the trade, although there is no information as to whether, or when, actual orders will be placed. On two gas lines, it is said, quotations for the line pipe have been asked, both lines to run from Louisiana, to St. Louis, Mo., and Birmingham, Ala., respectively, quantities being estimated at 115,000 tons and 40,000 tons respectively. Pipe for two other lines is being talked of, that by the Western Natural Gas Co., recently formed, to run from fields in Wyoming to Salt Lake City, involving 350 miles of 20-inch, and the other, 12-inch, by the Texas-Empire Companies from Tulsa to Lockport, Ill., involving say 60,000 tons.

The four lines would make a very large amount of line pipe to be placed at one time and would engage the welding capacity, in the sizes involved, for several months. The high months in steel production are commonly October and March, and between times there is a lull, so that mills are particularly desirous of booking special orders in that period. It is the regular thing, for instance, for the rail mills to seek business for winter rolling. Thus there may be a particular reason why projectors of gas lines would seek to place orders at this time, expecting close prices, but if there were a heavy demand the prices would not be so close.

Steel demand, as to fresh buying and specifying, is proving lighter, as was expected. While this swing comes after the election there is no definite reason for associating it with the election, there having been only a relatively small contingent in the past few months arguing that business men would push their trade activity to influence the election favorably. Rather the tapering off in activity should be ascribed to the season of the year, as regularly this has occurred. Last year the whole second half was rather dull and there was no distinct decrease late in the year. In 1926, which was a normal year in point of distribution of demand during the year, steel production was 9 per cent lower in November than in October, while in December it was 15 per cent lower than in October. This year hardly as much decrease seems likely.

Steel ingot production in October ran somewhat above the estimates made during the month, being at a shade over 91 per cent of capacity, and at almost the highest rate of the year, April having had that distinction. It is quite unusual for the second half peak to come at all close to the first half peak. Prospects now are that the year's total production of steel ingots will be about 50,000,000 tons, which would be 14 per cent above 1927 and 7 per cent above 1926, the record year.

The Steel Corp.'s unfilled obligations at the close of October amounted to 3,751,030 tons, representing an increase during October of 52,662 tons. Just what this means as to general trade cannot be estimated closely, because it is not known how much rail tonnage was formally entered on books. Orders allocated to the Steel Corporation amounted to 200,000 tons or more, while rail shipments were light, but some of the tonnage may not have been formally entered. It seems clear that in steel products other than rails the corporation shipped considerably more than it entered. Shipments were at about 89 per cent of capacity, against 84 per cent in September, the high month of the year having been April, at about 92 per cent.

For weeks it has been known that sheet mills were fully determined to advance prices "for first quarter" but there was doubt as to the amount. It turns out that the advance is $2 a ton, and the majority of producers have now signified their intention. This would make blue annealed sheets 2.10 cents, black 2.85 cents, galvanized 3.60 cents and automobile sheets 4.10 cents. By the program sheets for delivery this year would remain at former prices, $2 a ton under the figures just mentioned, but in practice many of mills sell at old prices to accumulate a back log, before really stiffening up to their supposed asking prices. Strips are also lined up for an advance, while bars, shapes and plates are likely to stay where they are. Billets are to be put up a dollar a ton, making rolling billets $34.

E. J. STEPHANY IS MADE SECRETARY NATURAL GAS DEPARTMENT, A.G.A.

E. J. Stephany, assistant manager of sales and service of the Philadelphia Company, Pittsburgh, Pa., has been appointed secretary of the Natural Gas Department of the American Gas Association. Under a recent decision, the office of the secretary will be located in Pittsburgh. Thomas Scofield had been acting secretary of the department for several months. Mr. Stephany also has been secretary of the Pennsylvania Natural Gas Men's Association.

Mr. Stephany is 36 years old. He is a graduate of the University of Wisconsin, Mechanical Engineering, 1913. After graduation he served as cadet engineer for a year and a half with the Western United Gas & Electric Co., Aurora, Ill. He worked in all plant departments during this time, and then was made assistant commercial manager of the company, which served 64 towns with gas, electricity, or steam heat. In 1916-17 he and two others went to Murphysboro, Ill., to start the Southern Illinois Gas Co. Franchises were secured in seven towns, and high pressure gas lines installed. Mr. Stephany was commercial manager of this group.

Late in 1917, Mr. Stephany returned to Aurora as commercial manager, and in 1918 went with the Equitable Gas Co., Pittsburgh, Pa., as industrial gas engineer. He organized and headed the sales department of the Equitable Gas Co. For the past two years he has been assistant to the manager of sales and service of the Philadelphia Company, the parent company of the Equitable Gas Co.

Mr. Stephany is well-known in natural gas circles as well as American Gas Association circles. He has spoken before several meetings of natural gas men. During the past year he was chairman of the Space Heater Approval Requirements Committee, chairman of the Commercial Section's Domestic Cooking Committee, a member of the Commercial Section's Merchandising Committee, and also of the Industrial Gas Section's Rate Committee.

E. J. Stephany

NEW PIPE LINE COMPANY FOR GAS IN MUSKEGON

By Special Correspondent

MUSKEGON, Mich., Nov. 19.—Formation of the Muskegon Pipe Line Co. to serve two of the largest potential users of natural gas in Muskegon, the Brunswick-Balke Collender Co. and the Central Paper Co., was announced this week. Pipe for the new line, the fourth to be laid between the Muskegon Field and consumers in Greater Muskegon, is expected to arrive early next week. Right of way for the new line with the exception of permission to cross several streets in Muskegon has been obtained.

The Central Paper Co. and the Brunswick-Balke Collender Co., which will use about 5,000,000 and 2,000,000 feet of gas a day, rejected the proposition of the West Michigan Consumers Co. to supply them with natural gas, as had originally been planned, because of their tentative schedule of rates filed with the Michigan Public Utilities Commission this week. As a result they are to pay the cost of the new line by which they will be served. The minimum rate of the West Michigan Consumers Co. was 20 cents per 1,000 feet for a daily consumption of 2,000,000 feet or more. The maximum rate was to be 50 cents per 1,000 feet.

The new company has purchased a portion of the open-flow capacity of three wells in the field at from 7 to 10 cents per 1,000 feet depending upon the quantity. The original estimate is that 7,000,000 feet a day will be needed, and

(Continued on Page 109)

CANADIAN GAS PRODUCTION

CHATHAM, Ontario, Nov. 17.—Official figures just issued by the Mining, Metallurgical and Chemical Branch of the Dominion Bureau of Statistics at Ottawa show that the natural gas production for the Dominion of Canada in 1927 was 11.3 per cent higher than the 1926 output. The 1927 production totaled 21,376,791,000 feet, valued at $8,043,010, compared with 19,208,209,000 feet valued at $7,557,174 in 1926.

Alberta once more held the position of premier producer of natural gas, with an aggregate production of 13,434,621,000 feet. Ontario came second with 7,311,215,000 feet, and New Brunswick followed with 630,755,000 feet. Average prices per 1,000 feet were: New Brunswick, 20 cents; Ontario, 59 cents; Alberta, 27 cents.

In the year 1927 imports of mixed natural and artificial gas into Canada from the United States amounted to 104,001,000 feet valued at $65,759.

THIRD OTTAWA LINE HAS BEEN COMPLETED

Announcement is made by the Cities Service Gas Co., of the completion of a third 16-inch natural gas line between Ottawa, Kans., and Kansas City, Mo. This line completes the project, started in 1927, which resulted in connecting western Missouri and northern Kansas directly with the company's gas reserves in Gray and Carson Counties in the Panhandle by means of a 20-inch natural gas line.

The entire pipe line, including both gathering and main lines, is 450 miles in length and has a daily delivery capacity of about 100,000,000 feet. This delivery involves the operation of six compressor stations, with a capacity of 27,000 horsepower, which were installed in conjunction with the pipe line construction. At the present time the Cities Service Gas Co. has a total open flow in Texas in excess of 750,000,000 feet daily from 28 wells located on the Empire's gas reserve comprising approximately 150,000 acres.

The third 16-inch line, which is of all-welded construction, has been tested from Ottawa to the Gardner crossover in accordance with the United States Bureau of Mines shut-in pressure drop test. It is expected the final section from the Gardner crossover to Glavin tap will be tested and placed in service in about a week.

EDMONTON RATE CASE

CHATHAM, Ontario, Nov. 17.—The Supreme Court of Canada at Ottawa recently heard the appeal by the city of Edmonton and the Northwestern Utilities Corp., Ltd., against the dismissal by the appellate division of the Supreme Court of Alberta of their respective appeals from the rate award of the Alberta Public Utilities Commission. The company contended that the utilities commission should have based the rates to be allowed on an estimated annual return to the company equal to 10 per cent of its investment instead of 9 per cent. The city claimed the rate schedule fixed by the commission was too high, the rate being 45 cents per 1,000 feet for the first 60,000 feet in a month, with a minimum of 28 cents per 1,000 feet over that quantity. The Supreme Court of Canada reserved judgment on both appeals.

AIRPLANE PLANTS USE GAS

Natural gas is making its contribution to the development of the nation's aircraft industry. Three plane manufacturing plants at Wichita, Kans., are now using natural gas for industrial and heating purposes, according to officials of the Cities Service Gas Co.

The plants are those of the Swallow Airplane Co., the Travel Air Manufacturing Co. and the Spearman Aircraft Corp. Service is being maintained from the main lines of the Cities Service Gas Co.

GAS FOR WINNFIELD, LA.

WINNFIELD, La., Nov. 17. — The Pineville Gas Co., Inc., marked the beginning of the use of natural gas from the Ouachita gas field by lighting the first gas heater to burn natural gas in Winnfield. Scores of residences and business houses will start using the gas.

FIND GAS IN FORMOSA

Announcement was made in behalf of the Japanese Oil Co., drilling at Kinsui, in Northwest Formosa, that natural gas has been struck.

Three Wells Completed in Colorado

Marland's Well in Lea County, New Mexico, Makes 25,000,000 Feet of Gas. Wyoming Wildcat Has Show of Wet Gas

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Nov. 17.—Three completions were reported this week in the Rocky Mountain area, all being in proven areas in Colorado. In southeastern New Mexico the Marland Production Co.'s No. 1 Lynn, in Lea County, picked up more gas and gauged 25,000,000 feet. The Midwest Refining Co.'s test on the Hobbs high was deepened to 4,221 feet and made 679 bbls. in 24 hours. That company's No. 1 Farnsworth in the Jal district is showing more water and the Marland's No. 1 Danciger ran into salt water and is shut down.

The salt dome tests of the Utah Southern Oil Co. in Grand County, Utah, are both cutting what appears to be regular formations of Pennsylvanian age, the Salt Valley well apparently having gone through the salt plug.

Northeastern Colorado is receiving considerable attention from wildcatters and several parties engaged in making geophysical surveys are reported in the field. A Pennsylvanian test near the Kansas-Colorado-Nebraska line in Yuma County, is resuming after company is reorganized. The Union Oil Co. of California has two completions on the Fort Collins Dome, one for 105 bbls. and the other 70 bbls. initial. Barrows' test on Round Butte is through the main Dakota and close to the Lakota and probably will go to the Sundance. Continental Oil Co. had a 110-bbl. well in Fremont County.

A show of 3,000,000 feet of wet gas at 646 feet on a wildcat on the Baggs structure in Carbon County, was the principal development in Wyoming. The gas was found in the middle Green River formation of Tertiary age. Recent surveys show that the Frannie-Sage Creek structure in Park County has a closure of 1,800 feet. The north dome of this structure was recently proven by the Rosenberg well.

New Mexico

The Marland Production Co.'s No. 1 Lynn, NW cor. SE Section 26-23-36, in the Ochoa district in Lea County, continued to attract considerable attention this week from the operators in southeastern New Mexico. This well had a flow of gas estimated at 15,000,000 feet at 3,091 feet, followed by shows of oil at 3,175-78, 3,180-81 and 3,182-84 feet. At 3,208 feet it ran into more gas, blew the mud out of the hole and looked as if it would turn into a big gasser. The gauge showed an open flow of 25,000,000 feet. The gas was dry and came from gray lime. The hole again has been mudded to drill deeper.

The Skelly Oil Co.'s No. 1 Joyner, NE cor. SE Section 26-25-36, in the Jal district, has not made any additional progress since last week when it flowed one head in which it made 100 bbls. in 12 minutes. After that several hundred feet of oil rose in the hole, but it did not again go over the top. The oil tested 28.6 gravity. The hole is still bottomed at 3,251 feet and boiler and steam engine are being moved in preliminary to drilling in. The hole is only 1 foot in the formation. The Midwest Refining Co.'s No. 1 State, NE cor. Section 9-19-38, on the Hobbs High, which has been on a production test from a total depth of 4,203 feet, where it made 984 bbls. the first 24 hours and then dropped down, has been drilled deeper. At 4,220 feet it was making 200 bbls. of oil and one-half a bailer of salt water every two hours. It was then deepened an additional foot without the water showing any increase and made 679 bbls. of oil from the lime in 24 hours from a total depth of 4,221 feet.

In Eddy County, Flynn, Welch & Yates have made a location for their No. 56 in Section 6-19-28, in the southern area of the Artesia Pool, and the Pecos Valley Gas Co., which recently commenced supplying Artesia with natural gas, is preparing to deepen No. 1 Vandergriff, SW cor. NE Section 6-17-28. This is an old well which was drilled to 1,115 feet and had 900 feet of salt water at 1,080 feet. Flynn, Welch & Yates' No. 1 Jackson, C NE Section 13-17-30, is drilling below 2,500 feet after passing through a second red sand which showed some oil.

In Chaves County, Warman & Mellor's No. 1 Blackdom, SE NE Section 27-13-24, is reported abandoned after drilling to 175 feet. R. T. Neal's No. 1 Russell, NW NW Section 21-14-25, is drilling below 1,018 feet in sandy lime. It had a show of gas at 1,015-18 feet.

In Quay County, the Gibson Oil Corp.'s No. 1 Parks, SW NW Section 25-8-32, on the Benita structure, is reported abandoned at 3,502 feet at which depth it has been shut down for a year.

In San Miguel County, H. E. Hoover's No. 1 Sanjuijusla, NE cor. SE Section 18-17-17, set the 6⅝-inch on bottom at 1,975 feet and is drilling out cement. Mark Brothers' No. 1 Benedict-Wilson, NE cor. SE Section 25-17-16, is drilling at 681 feet.

In Valencia County, the Rio Puerto Oil Co.'s No. 1 Ball, NW NE Section 13-6n-2w, is bottomed at 3,145 feet waiting for a string of 4¾-inch after swedging out the 6¼-inch. The Acme Development Co.'s No. 1 Santa Fe, SW NW Section 27-7n-4w, is pulling on the 8¼-inch casing which is frozen at 3,530 feet. Total depth is 3,550 feet.

In San Juan County, the Midwest Refining Co.'s No. 22, SE SE Section 26-22-14, Stony Butte structure, is drilling at 2,243 feet in gray sandy shale and making 2½ bbls. of water per hour. R. R. Burke and others' No. 1 Deneen, NW NW Section 18-21-13, in the same district, is drilling at 580 feet. It had a show of oil at 360-62 feet. The 8¼-inch was set at 370 feet. The San Juan Leasehold Co.'s No. 3 Bowman, Section 30-30-15, in the Meadows district, is drilling below 1,830 feet and carrying the 6⅝-inch. The Kirkland Drilling Co.'s No. 2 Hunt, SE cor. NW Section 10-29-15, in the Fruitland district, is reported dry and abandoned at 570 feet. J. F. Cross' No. 1 Blackfoot, SW SW Section 15-29-13, is reported abandoned at 740 feet, and the Dorothy Oil Co.'s No. 2 Goede, NW NE Section 29-30-9, in the Blanco district, is drilling at 560 feet. It is reported running 27 feet higher than No. 1 on the same quarter, which showed for a small well in the shallow sands. The Iowa Oil Syndicate's No. 1 Viles, SE SE Section 28-29-11, Kutz Canon district, is making a water shut-off at around 700 feet. The Rio Grande Development Co., composed mostly of residents of Monte Vista, Colo., has purchased the Morris and Griggs rig used on the Red Mesa terrace in Colorado, and is moving it to No. 2 Lanier, SE cor. NW Section 9-29-11, near Aztec, which will be deepened. It has been standing at 540 feet. Gas from No. 1 Lanier will be used for fuel.

In McKinley County, the San Juan Coal & Oil Co.'s No. 1 Ferris, NE SE Section 18-18-10, in the Seven Lakes district, is shut down at 1,860 feet. It had a small show of oil at 1,718-35 feet and water at 1,800-35 feet. Same company's No. 1 Santa Fe, NE Section 18-18-10, is drilling at 375 feet after passing through a 100-foot sand showing some saturation.

Utah

The two salt dome tests being drilled by the Utah Southern Oil Co. jointly with the Moab Consolidated Oil Co., in Grand County, Utah, are both at very interesting stages. No. 1-A J. L. Shafer, NE Section 36-26-20, on the Cane Creek Dome, is drilling in muddy salt at 2,220 feet. The salt was topped at 2,150 feet, 650 feet lower than in No. 1, half a mile to the south, and 300 feet lower allowing for difference in surface elevation. The two wells fail to correlate after passing out of the massive lime which occurred at 1,704 feet in No. 1-A, and formations encountered below that depth have indicated much greater regularity. No. 1 was located on the top of the dome and encountered massive beds of salt with good showings of oil and gas in strata in the salt beds. No. 1-A was spotted on the flank. Same companies' No. 1 King, Section 13-23-20, on the Salt Valley Dome, is drilling at 2,300 feet in hard lime. It went into salt at 1,650 feet and passed out and back into lime at 2,180 feet. It is presumed that the salt plug was cut at 1,650-2,180 feet and that regular formations are now being drilled.

The Utah Southern Oil Co.'s No. 1 Farnsworth, Section 29-4s-1e, Pleasant Valley structure, in Uinta County, is drilling at 890 feet in gray shale. This is a test of the Tertiary formations. The Continental Oil Co.'s Boundary Butte test in San Juan County, Section 23-43-22, is still fishing at 4,305 feet, and the Navajo Petroleum Co.'s No. 1 State, Section 2-20-21, Grand County, is drilling at 2,650 feet. The Phillips Petroleum Co.'s No. 1 Shick, Section 16-27-16, on the Barrier Creek anticline in Wayne County, is drilling in sandy lime at 3,650 feet. It is headed for the Hermosa lime expected at 4,300 feet.

Colorado

Northeastern Colorado is receiving considerable attention at this time from operators in Mid-Continent Field, who have been conducting extensive surveys with geophysical instruments in that territory, and some of these are reported to have blocked up considerable acreage. While no locations have been officially announced, it is expected that at least one test will be drilled and the Indian Territory Illuminating Oil Co. is mentioned as the concern most likely to put down a well. In fact, it is reported that this company is assembling materials for a test on the Fort Morgan anticline, and several locations have been mentioned, but so far there has been no official confirmation. The Magnolia Petroleum Co. also is mentioned prominently among the companies which have been making investigations.

A test between the Fort Morgan anticline and the Russell County, Kansas, operation which will have a direct bearing on the situation in that area is No. 1 Blackwolf, SW SE NW Section 7-2s-43, in Yuma County, which was started last April in a 24-inch hole by the Etnyre Syndicate and drilled to 850 feet. This syndicate entered into an agreement with the Parker Club, Inc., as noted last week, to resume operations on this well. The new organization will be known as the Major Petroleum Inc., and Ross E. Cooper, formerly of Cooper Brothers and Cooper & Henderson, and now drilling

(Continued on Page 144)

COURT REFUSES STATE INJUNCTION; MUSKEGON EXPECTING NEW LAWS

By Special Correspondent

MUSKEGON, Mich., Nov. 17.—The fate of the Muskegon oil and gas field for the next two months until a new set of oil and gas laws is enacted by the legislature, rests wholly with the operators as a result of the denial of the State's request for a permanent injunction against the flowing of one of the large gas and oil wells. A temporary injunction was granted the State about two weeks ago shutting in the Meeske Development Syndicate's No. 1 Drost well, SE SE Section 5-10-16. Instead of requesting the permanent injunction, the State's attorneys argued that the well should not be flowed as it jeopardized the value of the oil and gas rights on about 600 acres owned by the State.

The well is 2 miles from any state lands, and Judge Carr ruled the State would not be injured on this account. A motion for a new hearing will be entertained as soon as the drilling of Balch and Balch's No. 2 Muskegon County well, SW NW Section 8-10-16, has been started. The State has a one-eighth interest in the 10-acre piece on which No. 2 will be drilled.

More than 20,000,000 feet of gas a day has been flowing into the air from three wells for the past few days. Beverly H. Tucker, the new state field supervisor and inspector, asked that they be shut in until some disposition could be made of the gas and the operators are preparing to pinch in their wells to reduce the gas flow to a minimum.

In the meantime Mr. Tucker and W. L. Daoust, one of his two field assistants, are in Lansing conferring with R. A. Smith, state geologist, and officials of the State Conservation Department considering what might be done to save the field from ruinous production methods.

Three wells flowed this week have been making from 1,000,000 to as high as 10,000,000 feet of gas and from 1,200 to 1,500 bbls. of oil a day each. These are the Muskegon-Ottawa-Davis Oil companies' No. 1 Becker, NW SW Section 4-10-16, the Victor Oil & Gas Co.'s No. 1 Bensinger, NE SE Section 5-10-16, and the McAfee-Refior No. 1 Anderson well, NE NW Section 9-10-16.

The Becker well came in two weeks ago as the record producer with an initial flow of 3,000 bbls. a day. It is now good for 1,500 bbls. The other wells have made 1,200-bbl. initial producers each this week.

There are six other gas and oil wells recently completed in the Dundee formation which may be flowed open as a result of the court's decision, including the largest completion of the past week. The Muskegon-Ottawa-Davis Oil companies' No. 1 Reeths, SW SW Section 4-10-16, which came in at 2,069 feet with an estimated flow of 1,500 to 2,000 bbls. of oil and a gauged flow of 7,500,000 feet of gas.

Two other wells in the Dundee formation will make about 1,000 bbls. of oil a day each as initial producers, it is estimated, and from 1,000,000 to 6,000,000 feet of gas. They are the Johnson Oil Refining Co.'s No. 2 Smith, SE SE Section 5-10-16, and Kelley Goldboss' No. 3 Burns, SE SE Section 5-10-16.

Two other large wells have been shut in principally for gas wells, although both were drilled into the oil sands. They are the Paragon Oil Co.'s No. 1 Tripp,

(Continued on Page 143)

Important Factors in Pumping Wells

Symposium by Engineers of Mid-Continent Committee on Production Practice. Result of Round-Table Discussion With Field Men

By Mid-Continent Committee on Production Practice*
J. R. McWilliams, Chairman.

The purpose of this paper is to report the consensus of opinion on some important factors in pumping wells as expressed at a meeting of the A.P.I. Mid-Continent Committee on Production Practice. In addition to the regular membership of the committee several field men with practical experience also entered into the round table discussion of these various factors. Each member of the committee has written a short paper on one of the topics discussed. These papers, which are herewith presented, reflect the consensus of opinion of those present but not necessarily the personal opinion of the writer.

Central Power Pumping

By L. A. Ogden

For wells having a depth of 3,500 feet or less central power pumping has proven very satisfactory. It is the practice of most producers to install power equipment on a lease as soon as it is sufficiently developed to indicate that there will be enough producing wells drilled to justify the necessary investment. The installation of a central power permits a salvage of all the standard equipment except the derrick and thus reduces the capital investment on the lease. Until recently manufacturers have not kept pace with the demand for heavier equipment, but now there are all steel powers on the market with 30-foot band wheels equipped with eccentrics up to 36 inches and capable of carrying a load of 100 horsepower. There are a number of satisfactory winches on the market which can be used for pulling wells and some are designed for cleaning out. Until the past few years it was not considered practical to pump wells making more than 125 bbls. of fluid per day with jacks. At present, however, wells making as much as 475 bbls. of fluid, mostly water, are being pumped from central powers. Jacks giving a 5-foot stroke with 3-inch tubing are being used on these wells.

In installing powers it has been the ordinary practice to locate the power in the most advantageous place and then simply depend upon past experience to determine the size of engine necessary to handle the installation. By taking indicator cards from engines being operated on powers, it has been determined that in a great many cases the installation is overpowered, for instance, it was found that a 50-horsepower engine was carrying a load of approximately 20 horsepower. In other cases it was found that the engines were greatly overloaded. It is believed that it is advisable wherever possible to indicate the horsepower on pumping engines as a means of correcting trouble with the engine. In one case an engine that had been overhauled a number of times by the manufacturers' service man without satisfactory results, was found from a study of the indicator card to be out of time. This trouble being corrected, there has been no further complaint about this engine.

Study of Belt Records

A study of belt records has shown that a large percentage of belt trouble occurs at the clamp. As a means of eliminating this trouble endless belts are now being used to considerable extent. Great care must be taken, in ordering an endless belt, to obtain the correct length otherwise the stretch will be so great that it cannot be taken up by the ordinary type of idler, and the belt will have to be cut. There is on the market at present a so-called "floating idler" which uses a weight instead of a screw to put tension on the belt and which has a total travel of approximately 10 feet. If the belt is properly selected this idler will allow sufficient travel to take care of any stretch to be expected. In a number of cases the ordinary type of idler has been set on sills in a position parallel to the belt. When it has reached the limit of its take-up, the whole idler can be moved bodily towards the band wheel and placed in a second position on the sills so as to give a greater effective take-up. This type of idler is working out quite satisfactorily.

In the case of an electric driven power, the same result can be accomplished by the use of one of the various types of reduction gears now on the market where the motor is mounted on the gear and the entire assembly travels together allowing for a take-up of as much as 8 or 10 feet. It is believed that the use of the endless belt is justified; first, because the clamp, which is the source of most trouble, is eliminated; and second, because of eliminating the twist in the belt between the idler and the band wheel.

Gas Engine Drive

Probably the most desirable installation for the gas engine drive is obtained by using a counter shaft since this allows the selection of large diameter pulleys which give better belt service. However, there are a great many powers now in operation with a single belt driving directly from the clutch to the band wheel. It has been found in some cases with heavily loaded powers that better belt performances can be obtained by using small clutch pulleys and running the engine at a greater speed. When the engine is running at a high speed it gives a greater number of power impulses than at a slow speed, but each impulse is lighter and consequently does not damage the belt as much as a smaller number of more powerful impulses. In one instance, where a 24-inch clutch pulley was used, it was found necessary to cut the belt five times in two weeks when the engine was running at low speed. A 20-inch pulley was installed, the engine speeded up to give the same number of revolutions to the band wheel and the belt has been operating satisfactorily for several months without being cut.

It is possible to eliminate hold downs on shackle rod lines to some extent by computing the curve of the catenary and giving the rod line sufficient sag across low spots. Dynamometer tests have been run to determine friction losses in rod lines and it has been found that a considerable saving in power can be made by proper lubrication of the rod line supports. It was found that with a horsepower input to the rod line of 1.88 at the power, there was an output to the jack of 1.39 horsepower or a loss of 26.1 per cent in 1,700 feet of seven-eighths-inch rod line. This was with the rod line in average field condition. It was found that by carefully greasing the line a saving of 9.8 per cent of the total input at the power end could be made. In one 24-hour test on a motor driven power, it was found that the over-all efficiency from the motor through the power to the knockoff posts varied from 43 per cent to as high as 58 per cent, depending on the load at various times. The input at the motor varied from 24 to 39 horsepower.

Most jacks now being marketed are built so that they can be counterbalanced and this has proven as desirable as counterbalances on the beam pumper. A dynamometer test was run on a rod line which showed that 6.9 per cent of the power input at the driving end could be saved by counterbalancing.

A series of dynamometer tests on a number of different makes of jacks showed the mechanical efficiency of the jacks to range from 58 to 87 per cent with an average of 77.8 per cent. These jacks were all tested on the same well under as near the same conditions as possible.

TABLE NO. 1—WEIGHTED AVERAGE DOWN TIME IN HOURS PER WELL PER DAY

District—	Dec., 1926	Mar., 1927	June, 1927	Sept., 1927	Dec., 1927	Mar., 1928	June, 1928	Sept., 1928
Burkburnett	.570	.413	.356	.371	.387	.371	.377	.390
Desdemona	.870	.659	.503	.520	.472	.684	.753	.771
Duncan	1.401	.726	.480	.405	.386	.392	.359	.330
Hewitt	.883	.710	.747	.688	.663	.657	.628	.603
Powell	1.679	1.355	1.293	1.115	1.068	1.068	1.036	1.019
Arkansas	....	1.676	1.396	1.361	1.364	1.366	1.336	1.336
Kansas	....	....	.531	.572	.583	.565	.534	.484
Burbank	....	1.082	1.064	1.068	1.170	1.217	1.251	1.246
Cushing	....	.762	.513	.533	.540	.508	.555	.577
Slick-Bristow	....	1.008	.823	.796	.809	.816	.791	.764

Sucker Rod Stresses and Counterbalancing

By E. H. Griswold

The loads carried by sucker rods are composed of three distinct components, namely, the static load, the dynamic load and the frictional load. The static load consists of the weight of the rods themselves and the column of fluid lifted. The dynamic load is the load required to accelerate the static load to the required velocity and the frictional load is the resistance to motion caused by frictional effects between plunger, barrel, rods, tubing and in some cases the casing.

The static load may be reduced only by changing the size or location of equipment which is not often permissible. The dynamic and frictional loads cannot be eliminated but may be reduced by improved methods of operation. The dynamic loads and frictional loads often are in excess of 50 per cent of the static load and are the ones responsible for most rod breaks because of their impact effects. The dynamic loads are directly proportional to the rate of acceleration and may be reduced by avoiding excessive acceleration after reversal from down stroke to upstroke. Loose rig timbers are a common cause of high dynamic loads. The frictional loads may be alleviated by the use of the proper type and fit of pump and special rod couplings and guides although the latter are not free from mechanical troubles. Wells in which the rods do not drop freely and wells which are allowed to pound down cause a compressive or bending strain to be placed on the rods. The direct cause of rod failure is usually fatigue of the metal or defective manufacture as neither the elastic limit of the rod nor the designed strength of the joint are often exceeded in well operation. Alternate tensile and compressive stresses undoubtedly cause more rapid fatigue than the alternate application and release of a tensile load.

A.P.I. Rod Joint

The A.P.I. rod joint has been found to be more satisfactory than preceding joints, if properly made up. A.P.I. rod joints should be snapped up with a 36-inch wrench to secure the best results. An important feature of preventing pin breaks is that of obtaining a perfectly clean set of threads before making up. The manufacturers of high grade A.P.I. sucker rods are producing a more balanced rod than heretofore as the number of joint breaks and body breaks are more nearly equal in spite of the fact that higher tensile strength steel is being used.

Excessive acceleration and consequent dynamic loads may best be reduced by proper counterbalancing if the ordinary surface pumping equipment is to be used. Special pumping units, designed to permit a more uniform acceleration, are available but as these units are in the somewhat experimental stage and not free from additional mechanical trouble, they will not be considered.

Counterbalancing must be considered under two separate and distinct phases; first, that of reducing sucker rod acceleration, and second, that of decreasing the load on the engine or other prime mover.

In order to reduce rod acceleration the counterbalance design must be such that a smooth beam motion is obtained on both strokes. If the angular velocity of the band wheel is constant, the motion of the polished rod will approximate a harmonic motion. By counterbalancing so that the band wheel shows up slightly after the upper crank center is passed and before the full load of the well is picked up, the impact load may be reduced and acceleration will be more uniform. This method of counterbalancing relieves rod loads but increases the peak loads on engine and belting.

Counterweighting

In counterweighting for the purpose of reducing power consumption or engine loads a uniform angular velocity of the band wheel is desired. The ideal counterweight for one purpose may not coincide with the ideal counterweight for the other and the proper medium must be obtained. The only accurate method of determining the proper counterbalance is by use of a well dynamometer and either a recording wattmeter or gas engine indicator. Dynamometer records have revealed many load peaks and eccentricities which are not otherwise noticeable.

Heavier balances on gas engines and small flywheels on motors or jack shafts have been suggested as a means of reducing power loads. Devices of this type must be designed so that the weight may be readily removed when pulling rods or tubing.

Sucker Rods and Deep Well Pumping

By W. K. Whiteford

It was established very early in the pumping of deep wells that rod trouble increased very rapidly with increased depth. As it was not practical to increase the size of the rods due to the fact that the increased weight of the total string counteracted to a serious degree the gain in tensile strength, as well as increasing the problem of proper counterbalancing. A study of the rod records also revealed that over one-half of the breaks in the old type of rod were pin breaks. This ratio has been materially decreased by the use of especially heat treated pins—but there is still room for improvement. Experiments and tests, both laboratory and field, are being carried on constantly in the effort to increase the body strength of the rods by the use of alloy steels and heat treatment. Rods of A.P.I. specifications are in general use and as a whole, considered most satisfactory in performance. In order to develop the present rod, much laboratory work was necessary from both a chemical

(Continued on Page 139)

*Before Mid-Continent District, A.P.I. Division of Development and Production Engineering. Released by Mid-Continent District Committee.

Wider Horizons

THE natural gas industry has reached heights of achievement from which it looks out upon ever wider horizons. Its expansion has been one of the outstanding industrial accomplishments of the past quarter century. Because of it, scores of communities—hundreds of manufacturing plants—thousands of domestic consumers—are enjoying the benefits and economies of a better fuel.

It has been the privilege of the Hope Engineering Company, almost from the beginning of this great era of expansion, to contribute to the unprecedented progress with experience and resources, with man-power and equipment. The Hope name has been identified with most of the outstanding natural gas developments of the past 22 years.

Today it is ready to serve the industry even better than before—with investigations and reports on natural gas fields; analyses of markets; field surveys and estimates; engineering counsel; aid in organization and financing; pipe line construction; design, equipment and construction of main line and booster stations, layout and construction of distribution systems; management of operating enterprises.

HOPE

DESIGNERS ENGINEERS CONTRACTORS

HOPE ENGINEERING COMPANY

MOUNT VERNON, OHIO, U.S.A.

ORGANIZATION CONSTRUCTION MANAGEMENT

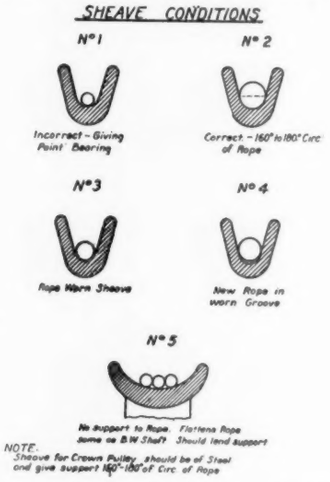
Inspection and Care of Wire Ropes

Mid-Continent Subcommittee on Specifications Makes Exhaustive Study of Material, Fabrication and Use

By Glenver McConnell*
Member of Mid-Continent A.P.I. Subcommittee on Wire Rope Specifications

The oil industry could no more progress without wire ropes than it could without steel tanks. Unlike tanks, wire rope is not easily inspected and failure of inspection does not present to the industry a visible exhibition of loss in the equivalent of dollars and cents. Loss of oil, or derivatives therefrom, is a positive loss and savings are likewise positive; prevention of loss due to service of wire rope is just as much on the profit side, but less positive.

Since 1925 increasing efforts have been made to improve the service obtained from wire rope in the Mid-Continent Field by first introducing a system of field records from which it was thought it would be possible to collect sufficient data to enable the users, in some wise, to select the most suitable rope to meet each particular field application. This system works admirably with some items of equipment, but it was


SHEAVE CONDITIONS
N°1
N°2
Incorrect - Giving Point Bearing
Correct - 160° to 180° Circ of Rope
N°3
N°4
Rope Worn Sheave
New Rope in worn Groove
N°5
No support to Rope. Flattens Rope same as B.W. Shaft Should lend support
NOTE:
Sheave for Crown Pulley should be of Steel and give support 160°-180° of Circ. of Rope

soon discovered hoisting equipment, like transmission equipment, depended greatly upon the care given by the field operator as well as frequent inspection by an observer qualified to know what constituted field abuses. In all justice to drillers, tool pushers and field superintendents for their knowledge of field equipment, it was discovered that what they considered good service, as well as correct application, would generally be full of errors and frequently the result of hasty judgment. Records of field service on ropes revealed so little definite information that would enable one correlating these data to determine quality, workmanship and the most suitable design of rope to use, that the entire subject of wire ropes necessitated a careful investigation by engineers and a satisfactory outline prepared to aid in the selection and field application.

Field Inspection

Early in 1926 a number of companies in the Mid-Continent area began to adopt a system of field inspection for visible defects of wire rope fabrication, and to develop methods of observing signs of break down of ropes while in service. Methods were tried for prolonging the life of ropes by a system of servicing conducted by trained men employed for that specific duty. These men acted, partially, as instructors to men on the derrick floor, which resulted in a gradual improvement of service records obtained and a better appreciation of many items of rig equipment introduced to increase the efficiency of rope service. At the same time, engineers were at work on laboratory procedure testing the quality of wire used and the properties desired for each grade of material.

The American Petroleum Institute began extensive research under the valuable leadership of C. C. Sharpenberg of the Standard Oil Co. of California, national chairman, with the result that a set of specifications for wire rope was adopted by the board of directors of the American Petroleum Institute at the Chicago meeting, December 8, 1927.

No Mid-Continent subcommittee of engineers was appointed until the early part of 1927, and their participation has been largely for the purpose of perfecting what has been already adopted for specification. Prior to final adoption of the specifications, the Mid-Continent subcommittee urged that, in fairness to the Mid-Continent producers it represented, it be given "further time for investigations, tests, and compilation of data," in order that its approval of the specifications when adopted could be given without any reservation. Certain criticisms had necessitated this request. The specifications having been adopted resulted in a strenuous effort by the Mid-Continent subcommittee to have a definite work accomplished for presentation at the next annual meeting of the Institute.

Specifications

Wire rope specification to be complete and acceptable should include, not only adequate tests by which quality and grade of material used in the rope may be checked, but should, also, include ways and means for determining workmanship and fabrication of the finished product. The specifications now include very desirable safeguards for the quality of wire used and definite means for ascertaining the physical qualities by laboratory tests. A number of us have been applying methods for determining quality of workmanship and fabrication of ropes purchased for the past two years and eight months. The result has been that many service records are available showing improved service of ropes and valuable data.

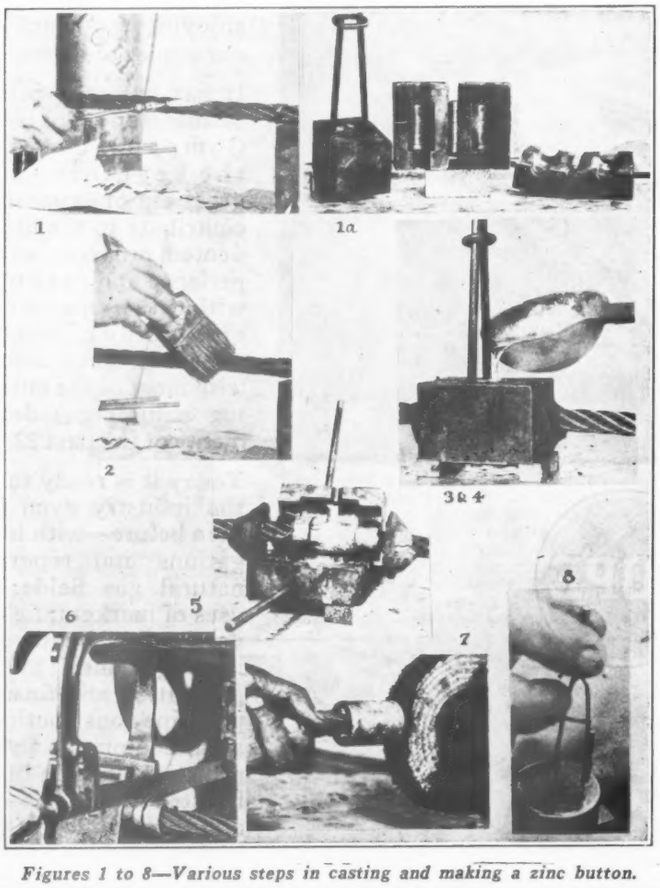
During the past year our subcommittee under the leadership of K. C. Sclater of the Marland Oil Co. conducted a vast amount of laboratory testing and correlation of field service records to determine largely what could be incorporated for specification on the subject of workmanship and fabrication.

Paragraph 17-A of the present specifications reads as follows: "The rope shall be made from the best quality of specified grade of material, shall be of good workmanship, and shall be free from defects which might affect its appearance or serviceability."

Care in Fabrication

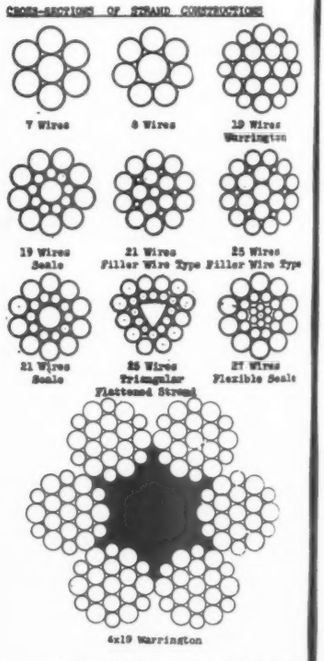
We believe this subject is of primary importance as it is the most valuable part of rope specification. To know defects in fabrication, would it not be possible to trace most of rope failures more definitely and give the user a better working knowledge of wire ropes? With this in mind and the warrant of the manufacturer given that specified materials have been used when he is permitted to use the A.P.I. stamp on his goods, we might expect, with a reasonable degree of assurance, a useful service life, provided the line is not abused in the field. It is possible to reduce to a minimum the necessity for laboratory work for checking the quality of ropes purchased. Rope engineers with years of experience have informed us that their handling of service complaints and adjustments, they have learned that most of the trouble directly traceable to poor ropes are due to defects in fabrication traceable to one or more of the causes the committee has outlined for presentation herewith.

Where ropes have given unsatisfactory service, both the user and the manufacturer are finally interested in ascertaining the cause and placing the responsibility. The causes of short service can be divided broadly into two classes, the first of which is improper handling of wire rope in the field. We, therefore, believe that the user, in trying to forestall the possibilities of large monetary losses, should be more interested in trying to detect ropes that are faulty before placing them in service instead of waiting for trouble to develop later.



Figures 1 to 8—Various steps in casting and making a zinc button.

Figure 1—The rope lubricant, for about one foot on each side of the space where the button is to be cast, is melted out of the rope without igniting the lubricant. Figure 1-a—Views of the button molds. Figure 2—The heated lubricant is completely washed out with gasoline. Figures 3 and 4—The mold is clamped around the central part of the cleaned space and both ends of the mold sealed tight with moist clay or gumbo. Molten zinc, heated just to the temperature at which wood chars, is poured into the mold. Figure 5—Immediately after the metal has set, the mold is opened and allowed to air-cool in order to prevent charring of the hemp center. Extraneous bits of metal are cleaned off the casting. Figure 6—The button is sawed in two at a point on either side of the pour-hole so as to avoid any small blowholes which might mar the finished surface. Figure 7—The sawed surface is filed smooth. The file marks are removed with fine emery cloth and then the button is polished on the buffing wheel. Figure 8—The center of the rope is located by scratching straight lines through the heart wires of opposite strands. This center point is carefully checked with the compass and accurately located for each pair of opposite strands. A sharp-pointed compass is used to scratch the circle in the zinc around the outside strands of the rope. Too much care cannot be taken in making the circumscribed circle just touch the outermost wires.



*Before Mid-Continent District, A.P.I. Division of Development and Production Engineering. Released by Mid-Continent District Committee.

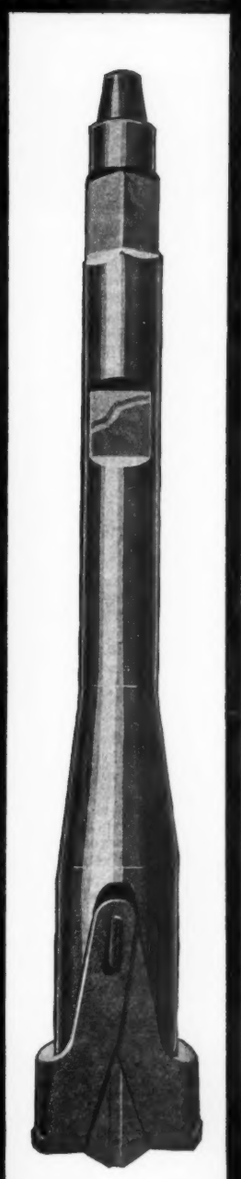
DEPENDABLE

The NEW TYPE SWAN

You can't afford to take chances on any part of your equipment, when you're drilling a hole a mile or more deep. The utmost Dependability is an absolute essential.

When you use the NEW TYPE SWAN for your underreaming, you wipe out every possible risk connected with this important job. No tool ever built is as DEPENDABLE as the NEW TYPE SWAN.

Phone, wire or write our Home Office at Wichita, Kansas, or any of our branches or distributors, for the complete story of the NEW TYPE SWAN.



Complete stocks of the Regular Swan Underreamer are carried in all of our branches, either for rental or sale. Full information will be gladly furnished by our branches or distributors on either the regular or New Type Swan.

THE BRIDGEPORT MACHINE COMPANY

GENERAL OFFICES AND FACTORY

WICHITA, KANSAS

"Branches throughout the oil fields"

Therefore any rope specification must be workable and instructive.

Ropes Used in Field

Before discussing field application and abuse, let us consider rope construction and fundamental details regarding points of good and poor fabrication. The following illustration shows the principal types of strand construction of ropes used in the oil fields.

You will recognize the 7-wire construction most frequently used for sand lines, the 19-wire of the Warrington construction generally selected for drilling

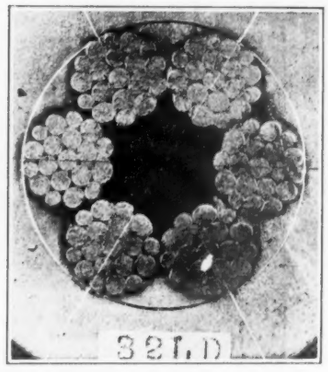


Figure 10—Round—no high and no low strands—no misplaced wires—no gaps between strands—button indicates good rope fabrication.

and swabbing ropes, the 19-wire Seale construction and the other types of filler wire constructions that make up the strands used for rotary hoist ropes and, finally, the patent flat strand also very desirable for hoisting ropes. We cannot go into the advantages of these various constructions, each type has its particular advantage.

Strands of any of these constructions are bound together around a hemp core, or an independent wire rope center, in a prescribed number of turns expressed in multiples of the rope diameter; so that for each size of rope, there is a prescribed length-of-lay within certain limits governed more or less by the service for which the rope is intended.

In the laying machine of a rope factory the strands are guided into proper position and brought together in a vortex

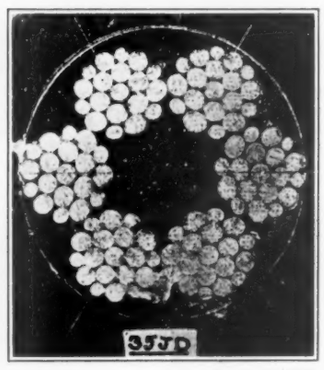


Figure 11—Badly out of round.

at the entrance throat of a guide block while being twisted into a regular symmetrical arrangement around the core rope. This gives the roundness and final external shape of the finished rope. The "closing" of the strands in a manner that is correct or incorrect is very important. With the wires selected properly, drawn within tolerances given in the present specifications and with the strands constructed and finally closed around the correct size core rope to produce a good finished product, the quality of material selected and the effectiveness of the lubrication used will determine the life-giving properties of any rope. But all ropes of the same size and construction look alike to the workman. We will, therefore, discuss briefly the points of fabrication that will show us visible defects, their probable cause, and their probable influence in field service.

Visible Defects of Wire Rope Fabrication, Probable Causes and Probable Influence in Service

A brief discussion of each of the defects listed is now in order to indicate the importance of each in wire rope fabrication:

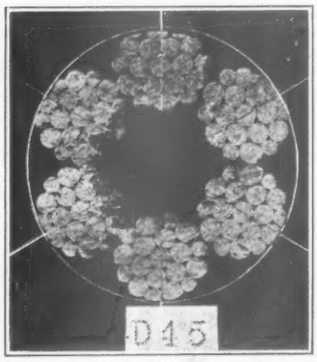


Figure 12—Used rope. Shows excessive wear on one high strand and very little wear on the opposite strand. Button shows importance of roundness in rope fabrication, proper tieing with wire, proper socketing of mandrel, and proper handling.

A-1. Excessive die scratching is readily recognized by a bright flat surface across the rounded surface of the outer wires in the strand, and looks as though part of the metal in these wires had been worn off. This scratching is very apt to be caused by the closing pressure of the die being too great or by improper alignment. The net result is that the badly damaged wires may have less metal to effectively resist the normal wear on the rope surface and may have reduced tensile strengths and torsion values, all of which may weaken the strand and cause a premature failure.

A-2. Excessive Gaps Visible Between Strands: When the core is too large or too hard, the strands cannot be properly closed around the core. Wide gaps between strands too frequently cause a change in the tension relations of the strands and, unless the rope is carefully broken into service, the load is apt to be unequally divided among the strands, some of which will be relatively tight and carry more than their proportionate share of the load and others will be relatively loose and form high strands which will receive more than their proportionate share of the wear on the surface of the rope. In other instances, the hemp core is apt to be cut and give improper support to the strands. The service life of the rope is usually shortened and, frequently, a complete break of the rope occurs.

A-3. Extruded Core: A large, soft core affords very poor support for the strands. In use, movement of the strands cuts the fibers in the hemp core until it collapses. The result is an excessive number of wire breaks, or a premature rope failure.

A-4. Rough Strands are usually caused either by misplaced or missing wires. This is very poor workmanship which is not always detected by the shop inspectors. The result is an uneven localized wear of the wires in these strands.

A-5. Broken Wires are usually caused by defective braizes or by "spotty" steel. Strands with broken wires are weakened

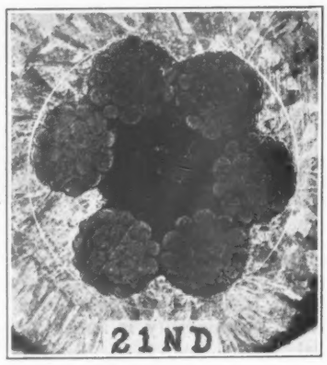


Figure 13—Round—no high and no low strands—one excessively large gap between strands—button indicates very poor rope fabrication.

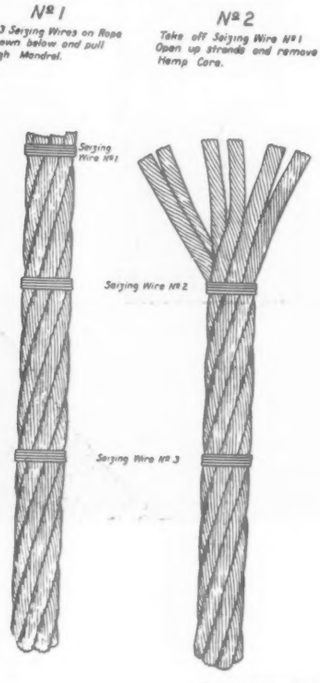
accordingly and have excessive localized wear.

A-6. Kinks and Dog-legs can be formed by improper reeling or handling. The result is "spot" wear and a premature rope failure in case of a bad kink.

A-7. Cut Wires and Crushed or Bruised Strands show that the rope has been damaged in handling or shipping by the reel running over or bumping into sharp obstructions. The final result is local wear or, if very bad, complete rope failure.

Examination of Cross Section of Rope

It is necessary to examine the cross section of a wire rope in order to have a complete picture of its construction.


№ 1
Put 3 Seizing Wires on Rope as shown below and pull through Mandrel.
№ 2
Take off Seizing Wire № 1 Open up strands and remove Hemp Core.
№ 3
Fray out Wires in Strands. Take off Seizing Wire № 2 and pull Mule Tail back into position in Mandrel. Pour Zinc, taking care that Socket and Rope are Vertical.
Seizing Wire № 1
Seizing Wire № 2
Seizing Wire № 3
Leave Seizing Wire № 3 in place until metal is poured and cooled

Rope muletail for socketing.

Certain points are mentioned in the A. P.I. specifications. The first sentence in paragraph 18-C reads: "The diameter of a wire rope is the diameter of the circumscribed circle . . ." This would imply a symmetrical arrangement of the strands around the core so that the outermost wires in each strand would uniformly just touch the circumscribed circle. In order for a rope to do this, it would have to be absolutely round. The last sentence in paragraph 21-B reads: ". . . However, the arrangement of the

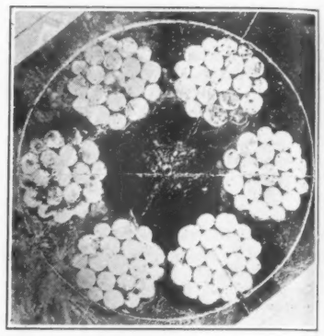
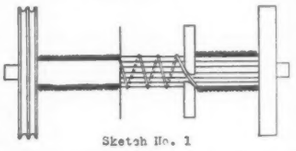


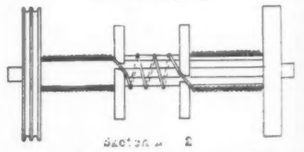
Figure 14—Example of excessively large gaps between strands. Button shows all strands widely separated from each other by a hemp center too large in diameter.

different size wires must be uniform and according to a regular symmetrical plan throughout." One can best check up on these points by an examination of the cross section of the rope. It is evident, therefore, that the shape of the rope must be preserved by some nondestructive means in order to obtain a clear cut cross section not damaged or distorted by sawing. Extensive experiments have shown that the best results were obtained by casting zinc around a section of the rope. This casting is called a "button." When it is properly made, the cross section of the wire rope specimen is found to be unaltered from its original shape or condition and can be easily and accurately studied and analyzed.



Sketch No. 1

Directions for installing usual design of steel dividers. Use 3-inch by 5-inch hard wood for lagging and place the 5-inch side against the shaft, drive pieces in place between the dividers, and between the divider and the brake wheel. Place wood lagging close together completely around the shaft, as shown in the above Sketch No. 1, and then cover with old belting by nailing it over the lagging.



Sketch No. 2

Directions for installing wooden dividers. When using wooden dividers be sure to bevel off the edges as much as possible where the line goes through, as shown in Sketch No. 2 above, as this will help to prevent kinking the line at these points. Use 4-inch by 5-inch hard wood for lagging, placing the 5-inch side against the shaft and drive the pieces of lagging solidly in place completely around the shaft, as shown in the above sketches. Place the lagging between the dividers, and between the divider and the brake wheel. Cover with old belting by nailing it over the lagging.

B-1. Roundness, or unroundness, in a wire rope is largely the result of the final shape imparted to the strands and the finished rope by the dies. This is the final touch of fabrication. A round rope means an even distribution of stress on the component parts and under proper conditions uniform circumferential wear; an unround rope means an uneven distribution of stress on the component parts and uneven circumferential wear even under the best of conditions.

B-2. Low or Drawn Strands may be caused by an unround rope or by

these strands being relatively tighter than the other strands. Low or drawn strands, whether due to poor fabrication or to the more prevalent mishandling or abuse in the field, are pulled tighter in service carrying a greater proportion of the load. The service life of the rope may be shortened and a one-strand break frequently marks the end of this kind of rope.

B-3. Strand Gaps. When the core is too large, gaps between strands are inevitable. Wide gaps and those moderate in size usually develop trouble in service unless the rope is very carefully broken in.

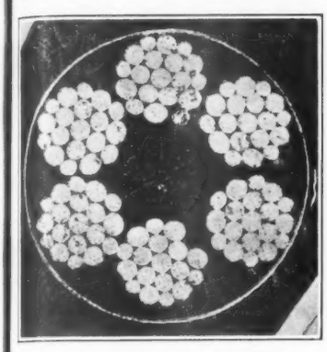


Figure 15—Example of a badly drawn or low strand. Button shows a missing wire in the low strand and two large gaps and one small gap between strands.

B-4. Misplaced and Missing Wires indicate careless workmanship and result in uneven localized wear of the wires in the affected strands.

B-5. High Strands may be caused by an unround rope or by these strands being relatively looser than the others. High strands, whether due to poor fabrication or to the more prevalent mishandling or abuse in the field, continue to develop as such in service and take an excessive amount of uneven wear on the rope. This usually shortens the rope's service life. The only example of high strands in 98 A.P.I. ropes examined for fabrication was found in a used rope, Figure 12.

It is evident now that the user can receive some new ropes which are defective and that the button has an important place in revealing such defects when present.

The important point in making a zinc casting on the rope is to have its dimensions such as to leave sufficient metal to hold the rope together and still not have too much metal, which while hot would char the hemp core. A set of five molds will take care of ropes from nine-sixteenths inch to 1¼ inches in diameter.

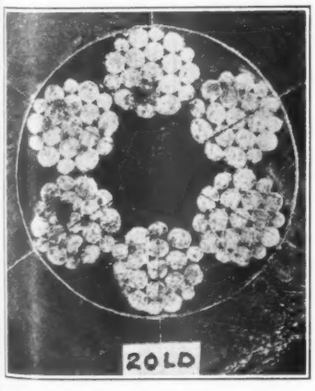


Figure 16—No high and no low strands—no gaps between strands—button shows strands are too tightly laid—poor rope fabrication if marked strand nicking is found.

Internal Inspection of Wire Rope

The internal inspection of a wire rope is primarily revealed by a detailed examination of the component parts of the rope, particularly the core and its lubrication.

C-1. The Length of 10 Lays of a hemp core is a measure of its relative hardness to other cores. The shorter the length for a given size core the harder it is. If the core is too soft, (too long a lay), it will not properly support the steel strands and may result in adjacent strand nicking. If the core is too hard, (too short a lay), the core will not have sufficient resilience to withstand the compression in going through the dies and will result either in wide strand gaps or in cut fibers.

C-2. Noticeable Impressions in the core made by the steel strands indicate the intensity of the closing pressure of the die. Other conditions being favorable, moderately deep strand impressions show that the core has been well compressed and gives good support to the strands. Where the impressions of the separate wires are noticeable without damage to the core and the other conditions being favorable, good rope service is to be expected. The absence of any noticeable impressions would indicate the core is too small or too soft as no permanent compression has taken place and the core does not properly support the strands. A large soft core is apt to have cut fibers extruding between the steel strands and may have only moderate strand impressions.

C-3. Adjacent Strand Nicking is the result of heavy die pressure when the core is too small or too soft, which will usually be in combination with light strand impressions. Where the core does not give proper support the strands bind against each other resulting in the nicking of the wires. As a consequence the rope loses its elasticity and the field result is usually the early breaking or "wickering" of the wires, particularly the wires in the valleys between the strands rather than on the top or crown of the strands. This condition frequently causes rope failure under quick application of load.

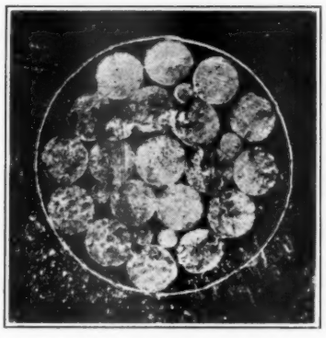


Figure 17—Example of a rough strand. Button shows two filler wires together and one filler wire forced between two large inner wires. Because of lack of support, the large outer wires dropped into filler wire spaces. The strand is angular instead of round.

C-4. Lubrication plays an exceedingly important part in the life of a rope and should be looked for in the following three places: First—the core should be examined for external (surface) lubrication both as to kind and amount. If there is very little or no lubricant on the core, there is no protection for core deterioration from rusty strands, as this lubricant protects both the core and the strands. Second—the core should be examined for the internal lubrication. If there is practically no internal lubrication, moisture will penetrate the fibers throughout the rope and cause rapid deterioration. Third—the steel strands should be examined for lubrication, both as to kind and quantity. This is particularly important for ropes used in briny or sulphurous fluid conditions. When there is practically no lubrication, rapid rusting will result in rapid deterioration of steel and core. A rusty rope frequently loses its elasticity and often breaks under sudden application of load.

System for Field Inspection and Improved Use

As stated in the beginning little progress may be expected without the employment of a trained wire rope inspector. He should be selected on the basis of his capacity to observe, with interest, all such points of rope construction above outlined. He should have field training as a derrick man, tool dresser, or driller. He should be taught by one having a good knowledge of wire ropes and should be, at all times, very open-minded in the manner in which he conducts his work. He will, thus, be equipped to prove valuable to his employer and to his colaborers in the field.

His duties should include the inspection of all new ropes, frequent follow-up inspections on a scheduled basis while the ropes are being used, and finally, when the rope is ready to be junked. He should be capable of assisting any derrick crew in handling the rope including socketing, splicing, and the rolling in of new core material. Should he be unwilling to assist a crew, when he is greatly needed, it may result in serious lack of co-operation on the part of the drilling crews.

The system laid down involves first, the inspection of new ropes as soon as they are received in the field, or by keeping a test specimen to be examined, should it be necessary to place a rope in service before an inspection can be made. The test specimen of a new rope should be 15 feet in length, seized at each end in three places before it is cut. It is very important, when cutting any wire rope, that it be seized properly with at least two or three seizing wires on each side of the cut so that the strands will be held tightly together preventing the rope from becoming unbalanced. An example of a rope test specimen is shown in Figure 39, which shows the approximate location for button casting. Details for casting the button have already been given, and it is the idea of the specification committee to specify a suitable design for steel molds to be used for casting buttons.

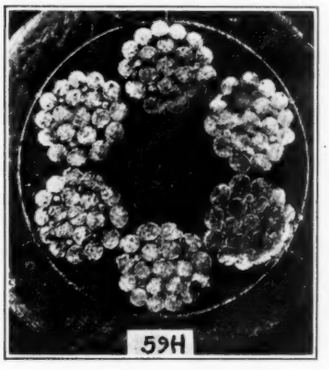


Figure 18—Round—No high and no low strands—two fair-sized gaps between strands 1 to 3 filler wires missing in each of several strands—button indicates careless rope fabrication.

Test Specimens

The inspector will examine tests specimens for all visible defects recording same on suitable forms to accompany his report. After making the examination, the button sample, together with a sufficient section of the strands and core, should be tagged with the name of the manufacturer, rope serial number, construction and grade of steel, and retained until the rope is completely disposed of.

Should the rope be accepted, his second duty is to see that it is properly unloaded from the truck when it reaches its destination, and that it is carefully unspooled. Information for unspooling ropes given in many wire rope catalogs appears to be misleading to the average field worker, and wire rope inspectors have had considerable trouble inducing men to use the correct method. The A.P.I. specification is very clear on this point, but for the sake of convenience, the attached direction sheet is presented herewith.

Illustration sheet for installing dividers on bull wheel shaft will show a safe procedure to follow in this regard. The length of a bull wheel shaft is such that where large coils of rope are used, one coil being the reserve and the other the live coil, the dividers should be well supported, so that they will not shift in position under long continued service. The directions given may appear to be unusual, but the method outlined of lagging between the dividers in a satisfactory manner is well worth the effort. Frequently lines are damaged due to shifting of dividers as well as by "dog-legs" or kinks made by the crossover around sharp corners. Often one observes that the crew will not maintain sufficient wraps of rope within the space between the two dividers to relieve load stress from the reserve coil that is loosely spooled on the shaft. Much may be written to satisfy the requirements for correct spooling on bull wheels and other hoisting drums, but anyone seeking information on abusive methods can find it in many publications on the subject.

Operating Conditions

After the line is installed, the inspector's third duty is to see that bad operating conditions are avoided as much as possible. Sheaves should be examined with feeler gauges and the sheave conditions noted as illustrated. Troubles that develop due to many abuses are very carefully outlined in the Appendix C of the present A.P.I. Standards No. 9-A, Sixth Edition. It would be well for every field operator to study the troubles listed therein and acquaint themselves familiarly with the causes. The wire rope inspector, visiting each location where the rope is in use, makes it his business to point out conditions that are not right; and he should be supported by those in charge, so that repeated instructions will not be ignored.

Proper socketing of ropes, while elementary to the user in other industries, needs further stressing at this time. Improper socketing is the cause of much wire line trouble in the oil fields. Socket-

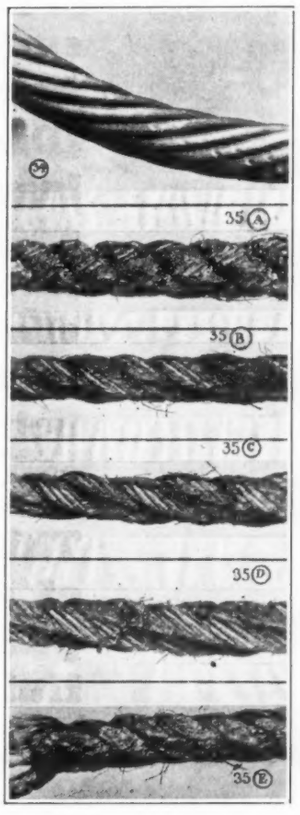


Figure 34—An example of adjacent strand nicking. Figure 35a—Hemp center with distinct wire impressions but without strand impressions; thick coating of core lubricant in spots. Figure 35b—Hemp center with faint strand and wire impressions and without any core lubricant. Figure 35c—Hemp center with distinct strand and wire impressions; traces of core lubricant only on ridges of strand impressions. Figure 35d—Hemp center with very distinct (prominent) strand impressions and deep wire impressions; evenly coated with dried-out black core lubricant. Figure 35e—Hemp center well lubricated, although not evenly, with black thick core lubricant.

How to Make More Divi

The IDECO Long Str
Increases Profits

1. Increasing production
2. Reducing sucker rod failur
3. Reducing belt trouble
4. Saving wear and tear on band wheel and rig

SHORT stroke pumping on deep wells necessitates high speeds to secure production. This increases sucker rod failures, belt troubles, power requirements and depreciation on the entire rig. Use of the IDECO Long Stroke Crank Counterbalance, combining the pull of gravity and kynetic energy [the flywheel effect] secures smooth, vibrationless pumping. This eliminates power peaks and pauses in the load. It reduces rod trouble, belt failures and wear on the machinery. Result—continuous pumping.

This device is provided with a series of adjustments and weights to compensate for the weight of rods and fluid.

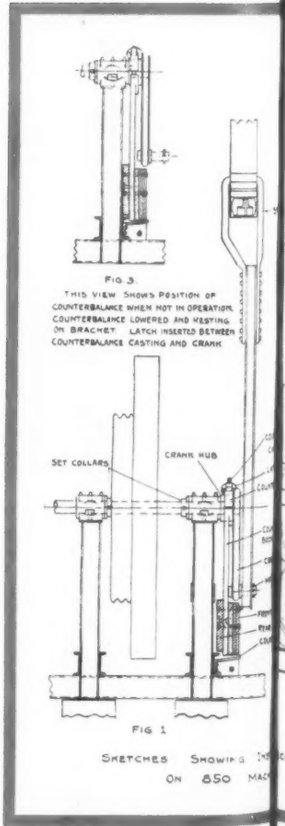


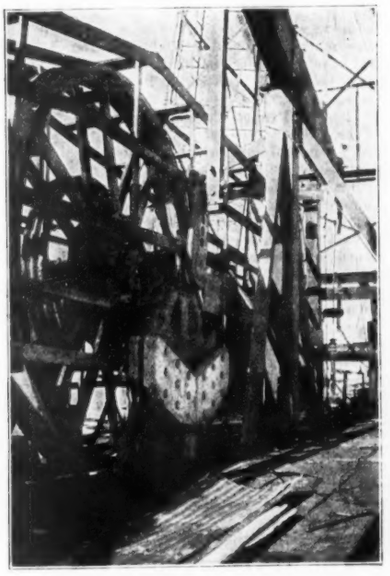
FIG. 3.
THIS VIEW SHOWS POSITION OF COUNTERBALANCE WHEN NOT IN OPERATION. COUNTERBALANCE LOWERED AND RESTING ON BRACKET. LATCH INSERTED BETWEEN COUNTERBALANCE CASTING AND CRANK.

FIG 1
SKETCHES SHOWING IDECO CRANK
ON 850 MAC

INTERNATIONAL
OIL FIELD IDECO EQUIPMENT
(GALVANIZED)

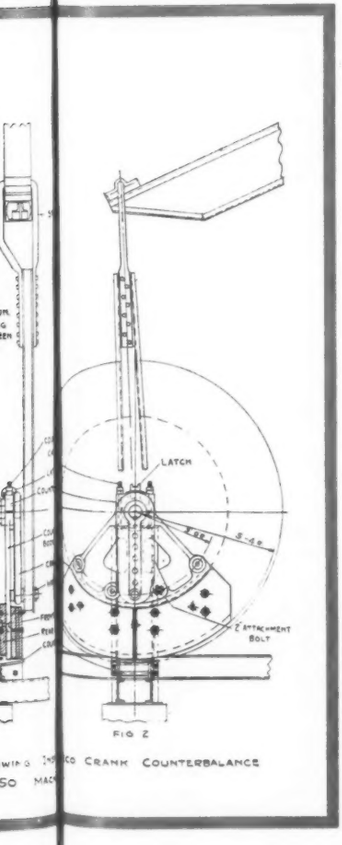
inds from Pumping Wells

Crank Counterbalance In Pumping Wells By—



5. **Decreasing expensive shut down periods**
6. **Reducing power requirements**
7. **Retaining the standard rig.**
   No changes necessary for reworking or deepening, etc.

Pumping strokes from 22″ to 72″ are obtained by shifting the wrist pin. There are no moving parts to wear or bearings to oil. The counterweight is quickly and easily disengaged to permit pulling rods and tubing. Due to the smooth operation, higher speeds can be used and lesss power is required. The counterbalance can be installed on any standard rig.



Operators report that the IDECO Long Stroke Crank Counterbalance often pays for itself in the first few weeks of operation and permits wells being put back on the pump that hitherto have been a liability. Their use on your wells will mean increased profits and dividends.

THE INTERNATIONAL DERRICK & EQUIPMENT CO.

Detroit, Dallas, Houston, Mexia, Wichita Falls, Odessa, Pyote, Borger, Corsicana, Pampa, Panhandle, Shreveport

The largest company devoted to the manufacture of steel (galvanized) equipment for the oil, gas and artesian industries.

Columbus, Ohio; Los Angeles, Cal.

Oil City, Smackover, Allen, Sasakwa, Eldorado, Tulsa, Tonkawa, Drumright, Okemah, Seminole, Torrance, Los Angeles, Taft

Export Representation: 74 Trinity Place, New York City. Columbus, Ohio Houston, Texas Los Angeles, Calif.

928

ing involves more than merely "getting the rope to hold," for if improperly done, it frequently causes unequal tension in the strands. This results in either high or tight strands, or both, when the full load is finally applied. Of course, a socket job should never be made by bending back the strands, as the metal merely gets to the outside wires, leaving the inside wires free to work. If a canvass were made, it would probably be found that the majority of drillers handling cable tools will still insist in preparing the socket in this wise.

Proper Socketing

The proper type of socketing authorized by manufacturers and good users is shown in the illustrations we have given. In making the socket the line is first made straight and all bends in the individual wires of the mule tail are fairly well straightened. The line must be served well with three seizing wires as shown in the illustrations before cutting. Be sure to use soft wire for seizing. Do not use soft rope! After opening up the wires, the grease and dirt must be removed. This is easily done by washing the wires in gasoline. It is also important to make sure that the socket basket is thoroughly cleaned. Zinc, only, should be used for socket metal. Care must be exercised to see that it is heated to the proper temperature, but not overheated, for burnt metal and a bad socket will be the result which will cause the blame to be attributed to the idea of using zinc.

To determine the proper temperature of metal to pour, the "pine stick method" is commonly used. When the "pine stick" is inserted into the hot metal and quickly withdrawn, it should not ignite or become more than slightly burned or charred, nor should it have any metal adhere to it. If the stick appears to be badly burned, the metal is too hot for pouring; if the metal adheres to the stick, it is too cold. Make sure that dross is carefully skimmed off as zinc will show more dross than No. 4 babbitt.

Lines should be frequently resocketed and, when doing so a careful examination made of the lower end of the rope. This is particularly necessary on drilling and swabbing operations.

Some Common Abuses

As abuses of wire rope are frequently mentioned and written, only the most flagrant abuses will be further considered. Perhaps, the worst abuse is induced by the use of drilling clamps to "let out screw." Unfortunately, this cannot always be avoided and we witness in recent years more and more use of the clamps for "slipping the rope" owing to the greater depths drilled, the slow motion required at these depths and the enormous weight of rope held by the clamps. Until better designs are introduced to improve or replace the temper screw, all that can be expected is to insist on minimizing the amount of clamp slipping and to frequently inspect the slips of the clamps to make sure that the corners are properly rounded off to prevent as much as possible the crown wires of the rope from being cut.

Another most serious abuse is jerking by sudden application of power on a loose line. A perfectly good rope may be badly damaged on the shaft or on the sheave by injudicious handling of power controller or throttle.

Numerous other abuses such as flagging the rope with pieces of telegraph cord, wire, strips of leather, etc., have frequently been observed. No better way could be found to start a high strand or to increase the wear of one strand disproportionately to the others than by the use of flags of hard material inserted through the strands of the rope. A few threads of soft rope may be used quite satisfactorily without causing any trouble.

Care should be exercised while swabbing, or running tools into fluid, to slow up the speed of the tools when they are nearing the fluid. Hard hitting at a high rate of speed means throwing in slack in the line, often resulting in strands opening and the core being forced out. This is commonly known as core popping.

Finally, it must be emphasized that wire ropes should be carefully broken in; otherwise, like the motor in a new car, early trouble and short life will be the result.

Methods of Increasing the Service

In swabbing service, hard drilling and occasionally on long clean-out jobs a wire rope receives much wear by being crushed out of round in the region where it is spooled on the bare shaft of the bull wheel. When this condition appears, it is desirable to change three or four coils from the storage to the service spool, thus replacing the distorted line with new rope where the worst strain occurs. After this method is employed a few times, it is well to cut off 75 to 100 feet, or whatever is considered necessary, from the bottom end of the rope, and resocket. Longer life will generally be obtained by more frequent cutting and resocketing.

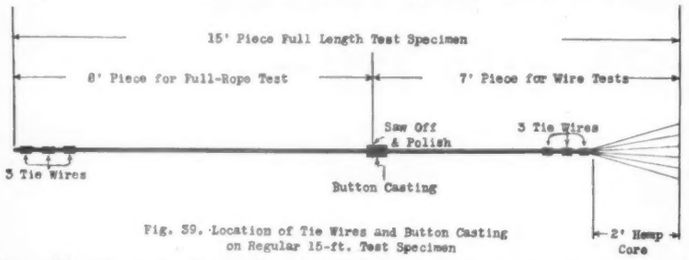
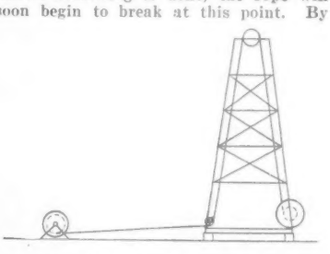


Fig. 39.—Location of Tie Wires and Button Casting on Regular 15-ft. Test Specimen

Repairing lines by inserting sections of new core is a process frequently necessary on lines used for running in fluid carrying a high percentage of salt water. In swabbing wells producing considerable water with the oil a poor hemp core will deteriorate very quickly permitting the lay of the rope to lengthen out early in the life of the rope. Swabbing operations offer a very good opportunity to observe the benefits derived from ropes carefully fabricated and containing a core of the best grade of material. In cases where the lay of the rope has been pulled down from, for example for seven-eighths-inch drillers, from 5½ inches originally to 8 inches, it may be found that the core has been badly crushed and has lost its life, and that unless something is done, the rope will soon begin to break at this point. By



Directions for putting on new line. Mount reel on horses equipped with brake drum and spool off from under side. Use a tubing block. Do not bend line under sill and do not use a snatch block. Estimate amount of line to be placed on storage end and measure this amount accurately by flagging over the derrick. Wind the line carefully on the bull wheel shaft, making it spool evenly like the thread on a spool. Wrap three coils between the dividers to take the strain off the storage end and continue to wind the line on the active space of bull wheel in an even manner.

Directions for transferring more line from storage end to spool on tug side, in order to prevent kinking the line during this operation. Run the tools in the hole to last coil on bull wheel shaft, set beam on headache post, and twist line up 40 to 50 turns (for transferring 150 feet of line), using a rope wrench. While one man holds the twist with the wrench, the other clamps the line with the drilling clmaps. Then you are ready to transfer the amount of line needed from the storage end.

using a good core of a size suitable for a new wire rope of slightly smaller diameter than the rope in service, one may insert this, following the removal of the old core, by use of a splicing needle through three strands of the center of the rope and turning the needle in a circular motion following the lay of the rope. This is known as rolling in a new core. It will materially increase the life of the rope and save splicing. It can be used successfully only in cases where the lay of the rope has not been pulled down to an extreme extent. For instance, it will be found that where the lay of a seven-eighths-inch rope has been pulled down to 10 or 11 inches considerable difficulty will be experienced in keeping the new core in place.

Lubrication

Lubrication of ropes while in service or, in anticipation of idleness upon removal from one location to another will undoubtedly increase the service obtained. Oil companies are greatly interested in this when it can be demonstrated that the cost of frequent application of lubricant is justified, some of us in the next few years will doubtless look back with amazement to our present day neglect in this matter. Proof of the importance of lubrication of an old rope came to my attention just recently. A 20-foot piece of seven-eighths-inch 6 by 7 left lay mild plow line, that was very rust bound and worn, was reported no good. The outer wires were worn one-third to one-half way through. The piece was cut for two test pieces. One piece was soaked over night in old engine oil before socketing and the other piece socketed in the condition received. The result of the breaking test for each is as follows:

	Original rust-bound specimen	Soaked in engine oil	Strength increase
Ultimate strength ..	29,700	40,840	11,140
First wire break ..	29,000	40,840	37.5%
No. strands broken	2	3	(*)
Ultimate elongation in 12-inch	0.118"	0.176"	0.058" 48.8%

*Better break.

Splicing may be successful where a rope has been damaged to such an extent that a break is likely to occur, unless the length of lay is pulled down to such an extent that a splice will not stay in place satisfactorily. Where splicing is avoided by replacing deteriorated sections of core with new core, it will finally be found that further efforts to increase the service of a rope by resorting to splicing will be unsuccessful. Satisfactory instructions for correct splicing can be obtained from any rope manufacturer and all that shall be mentioned here is to warn the users to make splices of long length to obtain the best results.

When a rope has been used to such an extent that the length of lay, core material, and the worn condition of the wires show that it is dangerous to continue further use, it should be removed at once. The inspector will be of use in determining when this condition exists and what disposition should be made of the rope. His final duty is to inspect all ropes after completion of service at each location where used.

Field Records

Three records may sound like asking for more information than is needed. This, however, is not the case. One record covering the original inspection of the rope is necessary, another record should be that which is filled in by the driller or farm boss, and a third record is prepared by the inspector covering his check on the operation conditions. The original rope inspection data may be on a suitable form on the back side of the inspector's service report. Standard forms for all three of these reports will require two sheets 8½ by 11 inches in size using both sides of each sheet. Our subcommittee believes that such forms can be developed satisfactorily for all purposes.

When a rope has completed its service, and is worn out and junked, the inspector will attach both sheets together covering the report of the rope and mail same to the company's office. Such forms should be preserved until such time arises when all data of wire rope records may be correlated to show the progress obtained by this system, particularly, regarding selection of ropes used and the service obtained. No amount of this data is of any use unless it is properly correlated at intervals of at least once or twice a year. The law of averages applied will show very profitable information. The cost involved for rope records and inspection will be but a fraction of the savings obtained; causes for adjustments become infrequent and without the usual conflicts that generally arise.

Check for Specified Product

In conclusion it may be stated that the Mid-Continent subcommittee has made every effort to work out the possibilities of determining by a system of physical inspection sufficient information to judge with a high degree of success the quality of construction that ropes should possess as A.P.I. product. There is no gainsaying the fact that the physical properties of the wires composing the rope are very important and should be of the best quality. We believe that, should any manufacturer agree to furnish the purchaser with A.P.I. specified product, he will not desire to stake his reputation alone on the quality of individual wires used but, also, upon how well he has built the structure—the rope. With the structure known, and abuses cured, service records and inspection records will reveal whether the steel is of doubtful quality. The purchaser retains the right to make laboratory tests, and when in doubt, he will doubtless check in this way.

The "system," having been a signal success with those who have used it, offers the most promising cure for adjustment abuses and "poor rope" records that our committee can devise for mutual benefit to user and manufacturer.

CROOKED HOLES TO BE STUDIED BY COMMITTEE

(Continued from Page 39)

division should be slow to recommend them, that there should be thorough tests under all sorts of conditions first.

Which Way Does Bit Go?

Interesting discussion centered about the question of what direction from vertical the bit is likely to take when it strikes the sloping surface of a specially hard formation. Will its deflection, if any, be up or down dip or lateral along the strike? Luther White, of the J. A. Hull Co., and H. B. Goodrich, consulting engineer and geologist, Tulsa, agreed in the opinion that since the resistance encountered by the bit in such circumstances comes from the upper side, its tendency would be to deflect toward a right angle to the hard formation surface.

Casing protectors, it was said, had a tendency to keep a hole straight. The condition of the bit was an important factor. A dull bit was likely to be turned by a hard sloping formation. A sharp bit would bite into it.

"Although we are not even sure what causes crooked holes, it seems as if excessive weight on the bit should receive careful consideration," said R. Van A. Mills, petroleum engineering editor of The Oil and Gas Journal. "If we bear so heavily on a long-stem auger bit that we flex the stem while boring through a mass of wood we get a crooked hole, and the amount of deflection will be cumulative. The same thing happens if we pound too heavily in driving a nail. It seems certain that suspended weight in a drill string should hang straighter and drill straighter than one that flexes the drill string by imposing an excessive weight on the bit. In a survey I made of the crooked hole problem results appeared strongly to favor the use of weight controls and weight indicators."

Wire Line Facts Pictured

Evidence of painstaking work was shown in the paper on "Inspection and Care of Wire Lines," presented by Glenver McConnell, Shell Petroleum Corp., as chairman of the committee on Wire Line Practice. Slides had been made for use in connection with the paper. These slides, which were projected on a screen, showed the process of manufacturing wire rope, the principal types of strand con-

struction, defects in fabrication, importance of proper lubrication, and a system of field inspection and improved use of wire rope. Mr. McConnell enumerated common abuses of wire rope and stressed the value of field records. He expressed the belief that many oil companies do not realize the economic importance of care in buying and using wire rope.

"While giving full credit to drillers, tool pushers and field superintendents for their knowledge of field equipment," said Mr. McConnell, "it was discovered that what they considered good service as well as correct application would generally be full of errors and frequently the result of hasty judgment. Records of field service on ropes revealed so little definite information that would enable one to determine quality, workmanship and the most suitable design of rope to use that the entire subject of wire ropes necessitated a careful investigation by engineers and preparation of a satisfactory outline to aid in selection and field application."

In the ensuing discussion of the paper Mr. Mills said that he believed it was considered bad practice in mining operations to use drums and sheaves with diameters less than 60 times the diameters of the wire lines. "If this is correct," he added, "does it not mean that the comparatively small sheaves and pulleys we use in the oil industry impose severe conditions on the wire lines?"

Responding to this question, Mr. McConnell pointed out that equipment installed for a permanent plant like that of a mining operation was not always regarded as necessary for an oil derrick, usually a temporary structure. C. A. Young added that there was a growing disposition in the oil field to increase the size of sheaves.

Beecher Presides in Afternoon

The afternoon session was presided over by C. E. Beecher, of the Empire Gas & Fuel Co. In treating "pumping wells" J. R. McWilliams, Skelly Oil Co., chairman of the committee on production practice, presented papers prepared by the six members of his committee, "Central Power Pumping," L. A. Ogden, Empire Gas & Fuel Co.; "Sucker Rod Stresses and Counterbalancing," E. H. Griswold, Marland Production Co.; "Sucker Rods and Deep Well Pumping," W. K. Whiteford, Barnsdall Oil Co.; "Working Barrels and Valves," L. B. Holland, Phillips Petroleum Co.; "Volumetric Efficiency of Pumping Wells," D. L. Trax, Gypsy Oil Co., and "Combination Flowing and Pumping Wells," Morgan Walker, Amerada Petroleum Corp. Mr. McWilliams himself dealt with "Pumping Records."

Lively discussion followed the reading of the papers. "Why can't we get the same production on the jack that we do on the beam?" asked Mr. McWilliams. Mr. Ogden replied that notwithstanding the common view, his experience led him to believe there is no difference in the production obtained by the two methods. Hollis P. Porter, consulting engineer, Tulsa, believed it was all a matter of competent engineering; that other factors being equal, the production obtained by the two methods would be the same. Others took the same view, though one opinion was expressed that the whipping action of the rods tended to make production on the jack smaller.

Glenver McConnell asked whether a central power unit was more economical than individual pumping units. Mr. Ogden said no definite data were at hand, but he believed opinion favored the central power. Mr. McConnell said the cost of equipment was likely to be in favor of single units.

When Should Sucker Rods Be Scrapped?

Comments on a question asked by Mr. Griswold indicated it had not been clearly established at just what point of depreciation a string of sucker rods should be discarded, the economic factor alone being considered.

A question by Charles Jacobsen, Barnsdall Oil Co., prompted statements which revealed no definite preference as between the double-pin and the pin-and-box sucker rods. There was laughing agreement, however, with Mr. Jacobsen's remark that "The fewer pins we have, the less pin trouble we have."

O. M. Evans, superintendent of the southern Oklahoma district for the Skelly Oil Co., said the introduction of a "down-time" record—he interpolated that it might better be called a service record—had lowered lifting costs in his district 10 cents a barrel. Before the adoption of down-time record system, Mr. Evans said, he had no clear idea of what lifting costs were. Careful, systematic records disclosed that 25 per cent of so-called down time was in fact simply waiting time—time elapsing while waiting for a crew to get on the job. With definite knowledge in hand it was possible to take steps to eliminate loss from this source.

The last paper of the day, "Fluid Levels, Back Pressure and Submergence in Wells," by S. F. Shaw, consulting engineer of San Antonio, Tex., was read by Ray F. Kohler, Carter Oil Co., Tulsa, in the absence of Mr. Shaw. Among other statements of interest in Mr. Shaw's paper was the one that, according to his own observations, the efficient rate at which to produce wells in the Seminole Field, as judged from the gas-oil ratio standpoint, was close to the maximum rate at which the oil could be produced.

Fun and a Good Dinner

Judge Dudley C. Monk, vice president of the First National Bank, Tulsa, was toastmaster at the banquet. He introduced H. M. Stalcup, vice president of the Skelly Oil Co., as a former banker who had come from McAlester (seat of the Oklahoma state penitentiary). "That is a reversion of the rule," he said. "Most of our bankers come from somewhere else and later go to McAlester." Speaking on the relation of management to oil field problems, Mr. Stalcup prefaced his talk by saying he was not an engineer, "but wasn't bragging about it."

"Up to 10 years ago," said Mr. Stalcup, "we rarely thought of bringing in an engineer to help solve petroleum's problems. But in the last 10 years, since we have turned more and more to technically trained men, greater progress has been made in the development and production of oil fields than in all the years before that. Today the producer who closes his eyes to the fact that his business is full of engineering problems will be left at the post."

C. A. Young complimented Mr. Watson and Mr. Whiteford on their arrangements for a constructive district meeting, which he characterized as "one of the most interesting and helpful I ever have attended."

Harry H. Smith, secretary of the Mid-Continent Oil & Gas Association announced that the assembled engineers had as much chance of learning anything from him as a woodpecker had of doing any good in a petrified forest and then gave a talk in which droll humor was interlarded with sound advice. He urged cooperation and unit development by oil companies. If oil company executives would show the same spirit of unity that the engineers displayed, the oil business would be transformed, he said.

Entertainment features, including songs by the Fearless Four, were interspersed through the program.

EMPIRE P. L. STATEMENT

The Empire Pipe Line Co.'s statement of business in October shows runs of crude oil of 1,247,883.79 bbls., daily average, 40,254.32 bbls.; deliveries, 1,223,043.06 bbls.; daily average, 39,453 bbls.; crude stocks, 3,674,491.06 bbls. Crude stocks at the close of September were 3,649,650 bbls.

GULF P. L. STATEMENT

The Gulf Pipe Line Co. (Oklahoma) in October ran 1,718,381.04 bbls. of crude oil from wells in Oklahoma and Kansas. Its shipments were 1,644,809.22 bbls., and crude stocks in Oklahoma and Kansas, together with those of the Gypsy Oil Co., 10,206,411 bbls. At the close of September the crude stocks were 10,129,332 bbls.

WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 48)

Van McPhail's No. 1 McIntyre, SE cor. Sec. 59, Blk. 352, 7 mi. S of Alpine ..... Shut down 1,740 ft.
Williams and others' No. 1 Poncey, 459 ft. S and 1,062 ft. E Sec. 26, Blk. 214, T.&St.L.R.R. Co. ..... Drlg. 515 ft.

COKE COUNTY

Cates & Dennis' No. 1 Mimma, 2,500 ft. S and 330 ft. E of NW cor. Sec. 47, Blk. 4, T.&P. ..... Drlg. 700 ft.
Lipan Oil Co.'s No. 1 E. C. Rawlings, Sec. 390, Blk. 1-A, H.&T.C. Sur. elev. 2,750 ft. ..... Shut down 2,860 ft.
Louisiana O. & R. Co.'s No. 1 Powers, 745 ft. S and 2,310 ft. E of NW cor. Sec. 156, Blk. 2 ..... Drlg. 2,875 ft.
Mid-Kansas Oil Co.'s No. 1 W. E. Lackey, 330 ft. N and E of SW cor. Sec. 272, Blk. 1-A, H.&T.C. ..... Drlg. 1,420 ft.

CONCHO COUNTY

Exploration Co.'s No. 2 Hartgrove, 906 ft. S and 985 ft. E of NW cor. Johann Scheuch Sur. No. 240 ..... Rig.
Kimberlin et al's No. 1 Maloy, Sec. 319, Ludwig Winkle Sur. ..... Shut down 1,460 ft.
Posey's No. 1 Elvidge, C NW Sec. 39, H.&T.C.R.R. Sur. ..... Shut down 300 ft.

CRANE COUNTY

C. C. Duffy et al's No. 3 Cowden Bros., 200 ft. N and W of SE cor. SW Sec. 18, Blk. X, C.C.S.D.&R.G.N.G. Sur. ..... Top salt 625 ft.; total depth 2,397 ft.; preparing to swab; 1,200 ft. in oil.
Gulf Production Co.'s No. 56 J. T. McElroy, 2,102 ft. S and 48 ft. W of NE cor. of their lease, Section 201, Blk. F, C.C.S.D.&R.G.N.G.R.R. Co. Sur. ..... Cem. 6-in. 2,694 ft.; drlg. 2,775 ft.
Gulf Production Co.'s No. 5 W. N. Waddell, 330 ft. N, and 280 ft. W of SE cor. NE Sec. 11, Blk. 25 ..... Top salt 1,215 ft.; top lime 3,100 ft.; 1,000,000 ft. gas 3,115-34 ft.; set 6-in. casing 3,162 ft.; drlg. 3,410 ft.; 1,500 ft. oil in hole.
Simms-Atlantic's No. 2 University-B, 990 ft. N and E of SW cor. Sec. 34, Blk. 30, University Land ..... Drlg. 2,710 ft.
Texas & Pacific C. & O. Co.'s No. 2 University, 2,310 ft. S and 1,650 ft. W line Sec. 34, Blk. 30, University Land ..... Location.
Tidal Oil Co.'s No. 1 University-D, 990 ft. from W and 1,650 ft. from S lines, Sec. 34, Blk. 30, University Land ..... Top salt 1,080 ft.; drlg. 2,695 ft.

CROCKETT COUNTY

Barbara Oil Co.'s No. 1 Cox, 227 ft. S and 1,190 ft. E of NW cor. R. B. Dickenson Sur. ..... Show gas 1,000 ft.; drlg. 1,007 ft.
V. T. Bolin & Co.'s No. 1 P. C. Coates, NW cor. SW Sec. 4, Blk. 2, I.&G.N. Sur. ..... Shut down 2,150 ft.
T. W. Callahan et al's No. 1 J. S. Todd, C SW Sec. 13, Blk. "YZ," E.L.&R.R. Sur. ..... Top salt 905 ft.; set 8-in. casing 1,155 ft.; 2,000,000 ft. gas 1,205 ft.; shut down 2,208 ft.
Compton's Co.'s No. 1 University Land, 1,875 ft. N and 916 ft. E of SW cor. Sec. 15, Blk. 50, University Land ..... Shut down 2,062 ft.; 300 ft. oil in hole at total depth and 1,200 ft. water 1,965-85 ft.; fishing 2,220 ft.
W. W. Donnelly & Young's No. 1 Massey, Sec. 29, Blk. U-Y ..... Shut down 380 ft.
W. W. Donnelly & Young's No. 1 Shannon, SW SW SE Sec. 42, Blk. BB, T.C.R.R. Sur. ..... Spudded and shut down.
W. W. Donnelly & Young's No. 1 Middlebuster, C Sec. 11, Blk. 9, D.&S.E. Sur. ..... 7,000,000 ft. gas at 1,663 ft.; shut down 1,690 ft.; small oil show.
Moncrief, Zoch et al's No. 1 J. H. Tippett, 330 ft. from C NE line Sec. 45, Blk. 31, H.&T.C.R.R., but in Sec. 1, Blk. JH ..... Location.
Texas-Canadian Oil Co.'s No. 1 University, 330 ft. from N and 305 ft. from E lines, Sec. 4, Blk. 33 ..... Show gas 1,250 ft.; shut down 1,275 ft.
J. D. Wheeler's No. 1 State Land, 744 ft. S and 1,250 ft. E from SE cor. Sec. 73, Blk. 1, O.&G.N.R.R., but in Vacancy Strip ..... Shut down 320 ft.

CULBERSON COUNTY

Deep Rock Oil Co.'s No. 2 Seay, 200 ft. N and 250 ft. E of CSL Sec. 20, Blk. 59, T.&P. Sur. ..... Rigging up standard tools.
W. S. Hillyer's No. 1 McGregor, C NW Sec. 14, Blk. 81 ..... Drlg. 355 ft., sand and shale.
Hickey & Stiver's No. 1, C. O. Finley, 660 ft. N and 1,980 ft. W, Sec. 20, Blk. 82 ..... Hole full water; small oil show 1,331 ft.; pipe set 1,418 ft.; drlg. 1,645 ft., lime.
Scott & Dittman's No. 1 Miller, 1,160 ft. N and 2,480 ft. E Sec. 1, Blk. 97, Public School Land ..... Rainbow 1,656 ft.; 300 ft. sulphur water 1,725 ft.; shut down for casing 1,767 ft.

DAWSON COUNTY

Magnolia Petroleum Co.'s No. 1 W. A. Jetter, C Sec. 1, Blk. 34, Twp. 4-N. ..... Top salt 1,650 ft.; drlg. 2,110 ft., salt; set 10-in. casing 1,815 ft.

ECTOR COUNTY

Pennsylvania Drlg. Co.'s No. 1 W. E. Connell, C NE Sec. 7, Blk. B-16 ..... Location.

EL PASO COUNTY

Sillix et al's No. 1 W. D. Malone, Sec. 46, James M. Day Sur. ..... Set 12½-in. casing 1,010 ft.; shut down 1,010 ft.

FISHER COUNTY

Bickerstaff et al's No. 1 McWhirter, 2,640 ft. E and 150 ft. N of SW cor. of Sec. 295, Blk. 2, H.&T.C. ..... Shut down 1,328 ft.
Cranfill & Reynolds' No. 1 J. L. Sharp, C NE of SW Sec. 207, B.B.B.&C. Sur. ..... Drlg. 1,365 ft.
Cranfill & Reynolds' No. 1 E. G. Young, C of NW of SW of Sec. 199, B.B.B.&C. Sur. ..... Total depth 3,155 ft., salt water.
Hucony Gas Co.'s No. 1 D. F. Maberry, 1,078 ft. S and 188 ft. W of NE cor. Elijah Bell Survey No. 327 ..... Drlg. 2,750 ft.; hole full salt water 2,735 ft.
Midwest Exploration Co.'s No. 2 Decker, 330 ft. S and E of NW cor. of S 60 ac. of W 160 ac. of N 320 ac. of Sec. 8, Blk. R, W. E. Richardson Sur. ..... Location.
Midwest Exploration Co.'s No. 1 Higginbotham, Sec. 8, Blk. R ..... Location.
Roeser & Pendleton's No. 1-B Decker, 455 ft. N and 330 ft. E of SW line of N 100 ac. of W 160 ac. of N 320 ac. of Sec. 8, Blk. R, W. E. Richardson Sur. ..... Drlg. 2,920 ft.
Sun et al's No. 2 Young, Sec. 208, Blk. 1, C NE SE, B.B.B.&C. Sur. ..... Top pay 3,125 ft.; total depth 3,130 ft.; swabbed 62 bbls.

GAINES COUNTY

Pure Oil Co.'s No. 1 A. A. Williamson, 1,650 S and 330 ft. W of NE cor. of Sec. 110, Blk. E, D.&W.R.R. ..... Ready to spud.

GLASSCOCK COUNTY

Atlas Drlg. Co.'s No. 1 Hamlin, C Sec. 7, 8, 18, 17, Blk. 32, T.&P. Sur. ..... Location.
Josey & Finchbaugh's No. 1 S. R. Cox, 1,320 ft. W or NE cor. and located on the N line of Sec. 29, Blk. 33, Twp. 4s, T.P.R.R. Sur. ..... Hole full salt water 780 ft.; hole full salt water 1,801-15 ft.; set 6-in. casing 2,607 ft.; top lime 2,602 ft.; shut down 3,272 ft.; hole full sulphur water at 3,232 ft.
Meriweather Oil Co.'s No. 2 McDowell, 1,492 ft. N and 150 ft. N of SE Sec. 35, Blk. 34, Twp. 2s, T.&P. Sur. ..... Location.

HOWARD COUNTY

Amerada Pet. Corp. and Rycade Oil Corp.'s No. 2 Dora Roberts, 990 ft. S and 2,240 ft. W of NE cor. Sec. 137, Blk. 29 ..... Location.
Amerada Pet. Corp. and Rycade Oil Corp.'s No. 3 Dora Roberts, 990 ft. S and W of NE cor. Sec. 137, Blk. 29 ..... Location.

When coring at 7000 feet or deeper —

they use ELLIOTT CORE DRILLS

Careful operators take no chances at such depths—either on getting adequate, informative cores or on running into a serious fishing job.

They use an Elliott Core Drill because they *know* it will get the core and will withstand any strains encountered in the roughest going with a high factor of safety.

Superior performance at seven or eight thousand feet insures superior performance at shallower depths—and there is no valid reason for taking chances by using inferior or ordinary coring equipment.

Above: Core taken at 7,542 feet (after being broken up for analysis of formation).

Right: Elliott cutterhead from Elliott Core Drill that took perfect core at 8,200 feet.

Ask our nearest branch for details of Elliott Core Drills and Elliott Service.

ELLIOTT CORE DRILLING CO.
850 Subway Terminal Building
LOS ANGELES, CALIFORNIA

BRANCHES:

3210 Harrisburg Blvd., Houston, Texas
618 Lake St., Shreveport, La.
Elms Specialty Company, 516 Seventh St., Wichita Falls, Texas
Export Office: 150 Broadway, New York
15 So. Madison St., Tulsa, Okla.
104 Brien St., Beaumont, Texas
417 S. Washington St., El Dorado, Arkansas

Elliott Core Drills

Amerada Pet. Corp. and Rycade Oil Corp.'s No. 4 Dora Roberts, 330 ft. N and 2,310 ft. E of SW cor. Sec. 128, Blk. 29, W.&N.W. Sur. — Location.

Amerada Pet. Corp. and Rycade Oil Corp.'s No. 5 Dora Roberts, 330 ft. N and 2,310 ft. W of SE cor. Sec. 128, Blk. 29 — Location.

Amerada Pet. Corp. and Rycade Oil Corp.'s No. 6 Dora Roberts, 330 ft. N and 990 ft. W of SE cor. Sec. 128, Blk. 29, W.&N.W. Sur. — Location.

Andrews & McCamey's No. 1 Neal, 200 ft. S and W of NE cor. Sec. 17, Blk. 32, Twp. 1s — Set 6-in. casing 2,825 ft.

Bristow & Merrick's No. 2 D. Roberts, 990 ft. E and 330 ft. N of SW Sec. 137, Blk. 29, W.&N.W.R.R. Sur. — Set 6-in. casing 1,950 ft.

Cosden & Co.'s No. 2 Dora Roberts-D, 1,650 ft. S and 990 ft. W of NE cor. Sec. 157, Blk. 29, W.&N.W. — Rigging up.

W. W. Donnelly et al's No. 1 Clay, SW cor. W half NE Sec. 127, Blk. 29, W.&N.W. — 700 ft. oil in hole from 1,919-27 ft.; 8 bbls. water 2,635-50 ft.; sulphur water 3,040 ft.; total depth 3,135 ft.; cleaning out 1,990 ft. after shot.

Dunnigan & Hyer's No. 3 Clay, 785 ft. N and 250 ft. E of SW cor. Sec. 126, Blk. 29 — Spudding.

F. H. E. Oil Co. et al's No. 7-B Dora Roberts, 330 ft. S and E of NW of Sec. 137, Blk. 29 — Rigging up standard tools 1,590 ft.

F. H. E. Oil Co.'s No. 8-B Dora Roberts, 2,310 ft. S and E of NW cor. Sec. 137, Blk. 29, W.&N.W. Sur. — Rigging up.

F. H. E. Oil Co.'s No. 9-B Dora Roberts, 1,040 ft. S and 2,310 ft. E of NW cor. Sec. 137, Blk. 29, W.&N.W. R.R. Sur. — Drlg. 1,497 ft.

F. H. E. Oil Co.'s No. 10-B Dora Roberts, 330 ft. S and 310 ft. E of NW cor. Sec. 137, Blk. 29 — Drlg. 235 ft.

F. H. E. Oil Co.'s No. 11-B, 1,700 ft. S and 2,310 ft. E of NW cor. Sec. 137, Blk. 29, W.&N.W. Sur. — Spudded and shut down.

F. H. E. Oil Co.'s No. 5-D Dora Roberts, 2,310 ft. S and 1,650 ft. E of NW cor. Sec. 136, Blk. 29 — Drlg. 2,083 ft.

Green Oil Co.'s No. 4 H. R. Clay, 785 ft. N and 250 ft.t W of SE cor. of Sec. 127, Blk. 29 — Rigging up.

Green Oil Co. et al's No. 1 J. W. Furrh, C SW cor. Sec. 11, Blk. 31 — Drlg. 1,580 ft.

L. C. Harrison et al's No. 1 G. M. Podge Est., SE cor. Sec. 9, Blk. 30, T-1-S, T.&P. Sur. — Hole full salt water 1,475-1,505 ft.; top lime 1,825 ft.; drlg. 2,963 ft.; 200 ft. oil in hole.

Henshaw Oil Corp.'s No. 1 Dora Roberts-C, 1,423 ft. S and 2,723 ft. E of NW cor. Sec. 6, Blk. 32, T-2-S, T.P. Sur. — Drlg. 1,950 ft.

Henshaw Oil Corp.'s No. 2-A Settles, 1,884 ft. E and 330 ft. S of NW cor. Sec. 6, Blk. 32, Twp. 2s, T.&P. Sur. — Drlg. 840 ft.

Louisiana Oil & Ref. Corp.'s No. 1 Kloh & Rumsey, 2,970 ft. E and 2,310 ft. S of NW cor. Sec. 3, Blk. 32, T-2S, T.&P.R.R. Sur. — Fishing 2,575 ft.

Louisiana O. & R. Corp.'s No. 1 W. R. Settles, 2,093 ft. E and 1,432 ft. S of NW cor. Sec. 6, Blk. 32, Twp. 1s, T.&P. Sur. — Rigging up standard tools 1,873 ft.

Louisiana Oil Corp.'s No. 2 Settles, 2,306 ft. E and 330 ft. S NW cor. Sec. 6, Blk. 32, Twp. 2s, T.&P. Sur. — Rig.

Magnolia Pet. Co.'s No. 11 Kelly-Chalk, 1,650 ft. S and 330 ft. E of NW cor. Sec. 124, Blk. 29, W.&N.W.R.R. Sur. — Set 10-in. casing 630 ft.; set 6-in. casing 1,515 ft.

Magnolia Pet. Co.'s No. 12 Dora Roberts, 1,650 ft. N and 330 ft. S of SW cor. Sec. 136, Blk. 29, W.& N. W. Sur. — Spudding.

Magnolia Pet. Co.'s No. 13 Dora Roberts, 2,440 ft. N and 1,650 ft. E of SW cor. Sec. 136, Blk. 29, W.&N.W. Sur. — Rigging up standard tools. 2,927 ft.

Magnolia Pet. Co.'s No. 14 Dora Roberts, 990 ft. N and 2,310 ft. W Sec. 157, Blk. 29 — Drlg. 2,765 ft.

Magnolia Pet. Co.'s No. 15 Dora Roberts, 2,310 ft. S and W Sec. 157, Blk. 29, W.&N.W. — Hole full oil and water; shut down 3,030 ft.

Magnolia Pet. Co.'s No. 16-D Roberts, 990 ft. N and 1,650 ft. E of SW cor. Sec. 136, Blk. 29, W.&N.W. Sur. — Drlg. 1,775 ft.

Marland Prod. Co.'s No. 11-A Clay, 250 ftt. S and 2,890 ft. W of NE cor. Sec. 139, Blk. 29, W.&N.W.R.R. Sur. — Set 6-in. casing 1,746 ft.

Marland Prod. Co.'s No. 4-E Chalk, 990 ft. N and 330 ft. E of SW cor. Sec. 124, Blk. 29, W.&N.W. Sur. — Location.

Marland Prod. Co.'s No. 1 Dora Roberts, SW cor. Sec. 128, Blk. 29, W.&N.W. — Drlg. 2,300 ft.

Marland-Texon Prod. Co.'s No. 1 Eason, 2,638 ft. S and 2,513 ft. E of NW cor. Sec. 6, Blk. 32, Twp. 2s, T.&P. Sur. — Location.

Marland-Texon's No. 5-A Settles, 2,310 ft. N and 330 ft. E of Sec. 135, Blk. 29 — Top pay 2,495 ft.; top lime 2,025 ft.; fishing 2,944 ft.

Marland & Group One Co.'s No. 6-A Settles, 2,266.5 ft. S and 2,513.2 ft. E of NW cor. Sec. 6, Blk. 32, Twp. 2s, T.&P. Sur. — Drlg. 1,000 ft.

Phillips Pet. Co.'s No. 1 J. Thomas, 330 ft. N and W of SE cor. of Sec. 13, Blk. 33, T-1-N, T.P. Sur. — Drlg. 830 ft.

Pure Oil Co.'s No. 7 Chalk, 990 ft. N and 330 ft. W of SE cor. Sec. 125, Blk. 29 — Location.

Schermerhorn Oil Co.'s No. 4 Roberts, 990 ft. S and W of NE cor. Sec. 157, Blk. 29 — Location.

Sun Oil Co.'s No. 3 W. R. Settles, 330 ft. W, 2,310 ft. N of SE cor. Sec. 135, Blk. 29 — Set 16-in. casing 250 ft.; oil show 1,800 ft.; oil show 2,345 ft.; 1 bailer per hour 2,345-55 ft.; total depth 2,991 ft.; swabbed 100 bbls., 50 per cent water.

Sun Oil Co.'s No. 4 Settles, 330 ft. W and 1,650 ft. N of SE cor. Sec. 135, Blk. 29, W.&N.W. Sur. — Drlg. 240 ft.

Texon O. & L. Co.'s No. 1 Quinn, 330 ft. N and W of SE cor. Sec. 11, Blk. 34, Twp. 1s — Drlg. 1,890 ft.

Ward Oil Co.'s No. 3 D. Roberts, 2,310 ft. N and E of SW cor. Sec. 137, Blk. 29 — Drlg. 200 ft.

Witherspoon & Glasscock's No. 1 Settles, 330 ft. S and 2,970 ft. W, Sec. 6, Blk. 32, T.&P. Sur. — Spudded with machine and shut down.

HUDSPETH COUNTY

American Land Co.'s No. 1 Lockhart and Roseborough, C SE Sec. 5, School Blk. 21 — Shut down 260 ft.

California Co.'s No. 1 University, 3,821 ft. N and 2,554 ft. E of SW cor. Sec. 19, Blk. E — Total depth 150 ft.

Western States Oil Co.'s No. 1 Moore, C SE Sec. 16, Blk. 71, Twp. 6, T.&P. Sur. — Straightreaming 2,700 ft.; total depth 2,740 ft.

Western States Oil Co.'s No. 1 Gardner & Moseley, NE NW Sec. 12, Blk. 18 — Hole full water 2,945 ft.; underreaming 8¼-in. casing at 2,840 ft.; trying to get water shut off; shut down 3,140 ft.

IRION COUNTY

Central Oil Corp.'s No. 1 Harlan Horney, 1,170 ft. N and 450 ft. W of SW cor. Sec. 3, Blk. 3, H.&T.C. Sur. but in Strip No. 1,026 — Drlg. 800 ft.

Fuhrman Pet. Co.'s No. 1 J. O. Suggs, Lease 1, C SE Sec. 3,024, Blk. 24, H.&T.C. Sur. — Location

Fuhrman Pet. Co.'s No. 1 J. D. Suggs, Lease 2, C SW Sec. 3,029, Blk. 24, H.&T.C. Sur. — Location.

Fuhrman Pet. Co.'s No. 1 J. D. Suggs, Lease 3, C SE Sec. 3,009, Blk. 24, H.&T.C. — Location.

Kimbrough & Tuel's No. 1 J. M. Nutt, 1,920 ft. S, 200 ft. E of NW cor. Sec. 5, Gonzales Co. School Land — Set 6-in. casing 1,360 ft.; show oil and gas; shut down 1,400 ft.

Mertzon Oil Co.'s No. 1 Roach, Sec. 24, 1,380 varas W, 485 varas S of NE cor. Mat Roach Sur. — Oil show 1,622-30 ft.; shot 30 qts. 1,522-30 ft.; hole full water; shut down 2,202 ft.

Signal Oil Co.'s No. 1 Suggs, Sec. 9, Blk. H. T.C.R.R. Sur. — Top salt 805 ft.; hole full sulphur water 1,865 ft.; drlg. 2,410 ft.

Sun Oil Co.'s No. 1 Williams, 1,190 ft. E and 230 ft. N of SW cor. Sec. 39, Blk. 21, H.&T.C.R.R. Sur. — Set 6-in. casing 2,423 ft.

F. E. Webb et al's No. 1 J. M. Nutt — Drlg. 2,030 ft.

Wesley West et al's No. 1 J. D. Suggs, SE NW SE Sec. 19, Blk. 7, H.&T.C. Sur. — Shut down 3,375 ft.; 2,700 ft. fluid in hole; swabbed 31 bbls. oil, 48 bbls. water in 24 hrs.

C. J. Wrightsman's No. 1 Sawyer, 1,320 ft. from N and W lines Sec. 3,032, Blk. 24, H.&T.C. — Location.

JEFF DAVIS COUNTY

J. K. Hughes Dev. Co.'s No. 2 Means, 1,622 ft. N line 600 ft. W line Sec. 345, Blk. 4, H.&T.C. — Show gas 3,271 ft., black lime; shut down for pipe.

JONES COUNTY

Anna Belle Oil Co.'s No. 1 Bickley, 330 ft. S and E of NW cor. SE NE Sec. 50, Blk. 18, T.&P. Sur. — Location.

Atkinson & Sandifer's No. 1 Hudspeth, 300 ft. S of CNL Sec. 22, Miles Sur. — Cem. 8-in. casing 2,335 ft.

W. G. Clark et al's No. 1 J. T. Thomas, 250 ft. S and 103 ft. W of extreme NE cor. Sec. 13, Blk. 19 — Drlg. 650 ft.

Cranfill & Reynolds and others' No. 1 Bickley, 510 ft. N and 150 ft. E of SW cor. Sec. 50, Blk. 18, T.&P. Sur. — Drlg. 2,115 ft.

Cosden & Herbert Oil Co.'s No. 1 Bickley, 320 ft. N and 319 ft. E of SW cor. S half of NW Sec. 50, Blk. 18, T.&P. Sur. — Rig.

Cosden & Herbert Oil Co.'s No. 5 Bickley, 330 ft. S and 319 ft. W of NE cor. of S half of NW Sec. 50, Blk. 18, T.&P. Sur. — Top lime 2,432 ft.; top pay 2,463-69 ft.; swab. 180 bbls. 4 hrs.

E. L. Evans' No. 1 S. W. King, Manuel Bueno Sur. No. 197 — Shut down 2,015 ft.

Hucony Gas Co.'s No. 1 Thomas, 330 ft. N and W of SE cor. E 40 ac. of S 80 ac. of J. Boston Sur. No. 276-A-19 — Location.

McMan Oil & Gas Co.'s No. 1 Bickley, 2,320 ft. W and 1,650 ft. S of NE of Sec. 50, Blk. 18, T.&P. Sur. — Drlg. 2,468 ft.; swab. 310 bbls. in 24 hrs.

McNeeley et al's, No. 1 Roscoe Bland, 1,175 ft. N and 240 ft. W of SE cor. Sub-Division 20, A-164, DeWitt Co. School Land — Rig.

Richardson Bros.' No. 1 Mrs. M. A. Martin, C E 80 acres, N half Sec. 13, J. Welhi Sur. No. A-468 — Shut down 722 ft.

Sinclair O. & G. Co.'s No. 2 Buckley, 975 ft. S, 320 ft. E of NW cor. N half NE cor. Sec. 50, Blk. 18, T.&P. R.R. Sur. — Drlg. 2,270 ft.

Snowden & McSweeney's No. 2 Bickley, 330 ft. S and 959 ft. W of NE cor. of N half of NW Sec. 50, Blk. 18, T.&P. Sur. — Top lime 2,484 ft.; 2,000 ft. oil 2,505-13 ft.

W. G. Stough et al's No. 1 J. P. Willis, J. C. Patterson Sur. No. 2 — Shut down 1,740 ft.

The Texas Company's No. 1 Camp, 330 ft. N and 290 ft. E of SW cor. 194.5-acre tract in Sec. 13, Blk. 19, T.&P.R.R. Sur. — Drlg. 2,245 ft.

Woods & Williams' No. 1 M. A. Parr, about 500 ft. S and E of NW cor. G. A. Kirkland Sur. A-507 — Drlg. 1,543 ft.

KENT COUNTY

J. S. Cosden & Co.'s No. 1 Wallace, Sec. 56, Blk. 98, H.&T.C. Sur. — Drlg. 3,495 ft.

Pursley Ranch Dev. Co.'s No. 1 fee, 300 ft. E and 150 ft. N of SW cor. Sec. 8, Blk. H, H.&T.B. Sur. — Location.

KNOX COUNTY

Deep Rock Oil Co.'s No. 1 Moore — Shut down 2,495 ft. for repairs.

Deep Rock Oil Co.'s No. 1 Big Four, 1,270 ft. S and 2,500 ft. W of NE cor. Sec. 21, Blk. 4 — Shut down 4,516 ft.; hole full of water.

LOVING COUNTY

Lockhart & Co.'s No. 2 Allen, 330 ft. NW and 330 ft. NE Sec. 82, Blk. 32, H.&T.C. — Top salt 722 ft.; drlg. 2,640 ft., sand.

Lockhart & Co.'s No. 1-A Lepp, Sec. 85, Blk. 33 — Set 6-in. casing 3,950 ft.; oil show 4,095--4,135 ft.; 250,000 ft. gas cleaning out 4,178 ft.; 2,000,000 ft. gas 4,172-75 ft.; top black lime 4,095 ft.; shut down 4,290 ft.; flows 20 bbls. daily.

Lockhart et al's No. 1 Wheat & Ramsey, 1,650 ft. NW and 900 ft. SW Sec. 83, Blk. 1, W.&N.W.R.R. Sur. — Top salt 1,120 ft.; drlg. 4,267 ft., lime; top pay 4,187-90 ft.; swab. 116 bbls. oil, 10 bbls. water daily.

MENARD COUNTY

Carpenter & Robbins' No. 1 Kothman, NW cor. SW SW Sec. 22 — Shut down 600 ft.

J. C. Barnett and T. H. Drake's No. 1 Callan City Co. Ranch, Sec. 22 — Show oil 1,857 ft.; shut down 2,061 ft.

Panhandle O. & R. Co.'s No. 1 G. P. Eckardt, C SW Sec. 10, Blk. 2, TW.N.G.R.R. Sur. — Top pay 3,001 ft.; 2,000 ft. fluid in hole; run 5 3/16-in. casing 3,013 ft.; hole full sulphur water 3,030 ft.; drlg. 3,080 ft.

Sorrels & Jackson's No. 1 F. Wilhelm, C NE Sec. 6, Blk. C, Brooks & Burleson Sur. — Shut down 290 ft.; bldg. new rig.

MIDLAND COUNTY

Shelton et al's No. 1 Kloh & Rumsey, 600 ft. N and E of SW cor. Sec. 13, Blk. 40, T-4-S, T.&P.R.R. Sur. — Top salt 1,800 ft.; top lime 4,510 ft.; shut down 4,565 ft.; salt water 4,563 ft.

Shoup et al's No. 1 Roy Parks, C NW Sec. 34, Blk. 41, Twp. 2s, T.&P. — Top salt 1,700 ft.; cem. 8⅛-in. casing 2,770 ft.; show oil 3,330 ft.; shut down 4,004 ft.

MITCHELL COUNTY

E. P. Campbell et al's No. 1 Pond, 1,065 ft. W, 660 ft. N of SE cor. Sec. 79, Blk. 27, T.&P. Sur. — Shut down 685 ft.

Hucony Gas Co.'s No. 1 C. Weichsel, 2,310 ft. N and 990 ft. E of SW cor. Sec. 78, Blk. 26, T.&P. Sur. — Top lime 1,342 ft.; shut down 1,990 ft.

Teas & Wheeler's No. 1 Radford, 1,320 ft. N and W of Sec. 1, Blk. 27, T.&P. Sur. — Drlg. 1,385 ft.

NOLAN COUNTY

Herbert Oil Co.'s No. 1 Pepper, C of N half Sec. 32, Blk. 22, T.&P. Sur. — Show gas 3,160 ft.; hole full sulphur water 3,190-3,202 ft.; shut down 3,303 ft.

W. E. O. & R. Co.'s No. 1 Allyn, 660 ft. E and 1,720 ft. N of SW cor. Sec. 48, Blk. 20, T.&P. Sur — Location.

PECOS COUNTY

Alexander & Lyle's No. 1 Myrtle Sellman, C SW SE Sec. 20, Blk .Z, T.C. Ry. Sur. — Top salt 814 ft.; top lime 1,602 ft.; 3,400,000 ft. gas from 1,611-26 ft.; spraying very little oil; shut down.

George Anderson's No. 1 University, C Sec. 11, Blk. 17 — Top salt 1,030 ft.; shut down 1,880 ft.

California Co.'s No. 1 M. A. Smith, Lease No. 1, 990 ft. S and 1,005 ft. E of NW cor. Sec. 21, Blk. 194, H.&G.N. Sur. — Bldg. rig.

California Co.'s No. 2 Smith, Lease No. 1, 797 ft. S, 3,533 ft. E of NW cor. Sec. 21, Blk. 194, G.C.&S.F. — Location.

California Co.'s No. 5 Smith, Lease No. 1, 2,668 ft. N and 1,355 ft. W of SE cor. Sec. 23, Blk. 194, G.C.&S.F. Sur. — Rigging up.

California Co.'s No. 6 Smith, Lease No. 1, 990 ft. N and 1,136 ft. W of SE cor. Sec. 23 — Spudding.

M. C. Dibble & Hale's No. 1 Bonebrake, Sec. 115, Blk. 8, H.&G.W. Sur., elev. 2,555 ft. — Top lime 1,305 ft.; set 6-in. casing 1,610 ft.

Ditto Oil Co.'s No. 1 J. M. Montgomery, Sec. 104, Blk. 331, A16,337 — Shut down 660 ft.

Mauch & Kroger's No. 1 Holmes, Sec. 5, Blk. 178, T.C. Sur. — Shut down 1,010 ft.

McCarty Oil Co.'s No. 1 Bennett, 960 ft. S and E of NW cor. Sec. 592, G.C.&S.F. Sur. — Drlg. 448 ft.

Mid-Kansas Oil & Gas Co.'s No. 11 Yates-C, 250 ft. S and 845 ft. E of NW cor. Sec. 60, Blk. 1, I.&G.N. — Drlg. 995 ft.

Pecos Valley Oil Co.'s No. 1 fee, Sec. 22, Blk. 16, H.&G.N. Sur. — Set 8-in. casing 1,015 ft.; top salt 1,115 ft.; shut down 1,420 ft.

B. J. Spikes' No. 1 George Brown.....Shut down 700 ft.
Rio Pecos Oil Co.'s No. 1 Yates, 330 ft. S and E of NW cor. Sec. 543, Blk. 1, H.&G.N. .....Drlg. 565 ft.
Roxana Pet. Corp.'s No. 3 Smith-D, 330 ft. S and E of NW cor. of S half of Sec. 24, Blk. 194, G.C.&S.F. Sur...Drlg. 365 ft.
Schumaker et al's No 1 Williams et al, 330 ft. N of middle of S line, Sec. 1, Blk. 117, G.C.&S.F.....Spudded and shut down.
Southern C. O. P. Co.'s No. 1 Scharbauer Estate Co., SW cor. Sec. 21, Blk. 134, T.&S.L. Sur. .....Show gas 1,455-60 ft.; drlg. plug 2,964 ft.

Talbot & Ditman's No. 1 Unsicker, 1,320 ft. from E and 660 ft. from S lines, Sec. 25, Blk. 10, H.&G.N.....Spudded and shut down.
Transcontinental Oil Co.'s No. 1 University, NE NW SW Sec. 18, Blk. 18.....Top lime 1,155 ft.; shut down 4,130 ft.

World Oil Co.'s No. 1 Kloh, Sec. 47, Blk. 45, Twp. 8, T.P.R.R. Sur., elev. 2,810 ft.....Shut down 3,105 ft.

PRESIDIO COUNTY

Eastland Oil Co.'s No. 1 Smith, Cen. Sec. 17, Certificate 463, or Blk. 351, G.C.&S.F.R.R.....Spudded and shut down.
Phillips Pet. Co., Empire G. & F. Co., Delmar Oil Co. and C. E. Miller's No. 1 Tootle Est., C NE Sec. 75, Blk. 3, D.&P.R.R. Sur.....Fishing 690 ft.
L. C. Brite's No. 1 Lee, Sec. 50, Blk. 12, G.H.&S.A. Sur., center of section.....Drlg. 2,730 ft.

REAGAN COUNTY

Empire Gas & Fuel Co.'s No. 1 Sawyer Cattle Co.-A 4,160 ft. from S line and 330 ft. from W line of Sec. 18, Blk. A, Leonard G. Gee Sur. .....Top salt 910 ft.; shut down 2,160 ft.

Texon O. & L. Co.'s No. 1-B University Group 1.....Top pay 6,250 ft., hole full of oil; well made two small heads; drlg. 8,445 ft., black shale.

Skelly Oil Co.'s No. 3 University, 2,310 ft. N and E of SW cor. Sec. 33, Blk. 8, University Land.....Top salt 1,320 ft.; drlg. 2,525 ft.

REEVES COUNTY

D. P. Davis et al's No. 1 H. C. McCart, 300 ft. S and 200 ft. W of NE cor. S half NW Sec. 26, Blk. C-18.....Shut down 25 ft.
Exploration Co.'s No. 1 A. A. Kinney, 1,500 ft. W of NE cor. Sec. 26, Blk. C-18, Public School Land, elev. 2,847 ft. .....Total depth 2,900 ft.; shut down.
Dr. Kitsis et al's No. 1 Kloh & Rumsey, 330 ft. N and W of SE cor. Sec. 5, Blk. 54, Twp. 5, T.&P. Sur.....Drlg. 630 ft.
David R. Thompson's No. 1 A. A. Eddins.....Swedging csg. 5,658 ft.; pulling 5-in. csg.

World Oil Co.'s No. 1 A. L. Duff, 1,500 ft. from S. 850 ft. from NE. lt. S. Johnson Sur. No. 68.....Elev. 2,774 ft.; total depth 4,515 ft.; plugged back 4,223 ft.; hole full fluid, slopping 1 bbl. of oil daily.

RUNNELS COUNTY

Agnew & Sons, Inc., No. 1 R. R. Russell, in Mrs. H. Holbien Sur. No. 13½.....Show oil and gas 3,990 ft.; hole full water 4,025 ft.; plug back to 4,001 ft.; will shoot.

R. D. Hamilton et al's No. 1 A. Spill, 1,320 ft. S and W of NE cor. A. Spill 891 acres, out of Thomas R. Webb Sur. No. 358 .....Shut down 100 ft.
McLean et al's No. 1 G. W. Clayton, 150 ft. N line, 270 ft. from W line Sec. 135, E.T.R.R. .....Shut down 1,185 ft.
Nourse & Tilton's No. 1 R. A. Cramer, 200 ft. S. 600 ft. E of NW cor. G.C.&S.F. Sur. No. 2.....Shut down 100 ft.
R. B. Summers at al's No. 1 J. W. Reese, M. J. Parramore Sur. 26 .....Shut down 1,650 ft.
Union Oil Co. of Nevada's No. 1 W. E. Allen, 1,000 ft. N and W of SE cor .Sec. 1, H.E.&W.T. Sur.....Shut down 1,365 ft.

SCHLEICHER COUNTY

J. F. Long and O. C. Long's No. 1 W. H. Williams, NE cor. Sec. 28, H.E.&W.T.R.R. Sur.....Shut down 275 ft.

SCURRY COUNTY

Landreth Prod Co.'s No. 1 Hillmer, 330 ft. N and E of Sec. 75, Blk. 25, H.&T.C.R.R. Sur.....Top salt 870 ft.; hole full sulphur water 2,740 ft.; drlg. 3,120 ft.

I. B. Mims et al's No. 1 J. J. Koonsman, Sec. 216, Blk. 2, H.&T.C. Sur. .....Spudded and shut down (corrected).

G. E. Dieckman and R. B. Pender et al's No. 1 F. C. Davis, 1,000 ft. N and 1,770 ft. W of SE cor. of Sec. 275, Blk. 2, H.&T.C. Sur. .....Drlg. 900 ft.

STERLING COUNTY

F. & G. Oil Co.'s No. 1 W. L. Foster, C SE Sec. 20, Blk. 12, S.P.R.R. Sur. .....Show oil 1,296-98 ft. and 1,356-58 ft.; total depth 1,420 ft.

STONEWALL COUNTY

Sun Oil Co.'s No. 1 Reynor, 346 ft. S and W NE cor. Sec. 20, Blk. B, H.&T. C.....Drlg. 3,130 ft.

SUTTON COUNTY

Phillips Pet. Co.'s No. 1 A. G. Holman, 2,310 ft. S and 330 ft. W NE cor. Sec. 25, C.C.S.D.&N.G.R.R. Sur.....Fishing 5,770 ft.
Phillips Pet. Co.'s No. 1 Cusanbary, 2,310 ft. E and 330 ft. S of NW cor. Sec. 39, C.C.S.D.&R.G.N.G. Sur. .....Drlg. by tools 195 ft.

TAYLOR COUNTY

Burnham et al's No. 1 A. M. Y. X.....Set 10-in. casing 780 ft.
Grisham-Hunter Oil Corp.'s No. 1 T. L. Stevens, 220 ft. S and E of NW cor. Sec. 53, Blk. 19, T.P. Sur.....Shut down 2,650 ft.; no show in lime 2,580-2,625 ft.

Hurley Oil Co.'s No. 1 Mrs. A. R. Payne, 330 ft. N and E of SW cor. E 80 acres of NW Sec. 52, Blk. 19.....Drlg. 2,185 ft.

TERRELL COUNTY

Big Bend Oil Co.'s No. 1 Bassett, C NW Sec. 155, Blk. D, M.-K.-T.R.R. .....Spudded and shut down.
Champlin Ref. Co.'s No. 1 Corder, C Sec. 110, Blk. 1, C.C.S.D. Sur. .....Cem. crevice 3,535-40 ft.; shut down 3,552 ft.

Keck Pecos Trust Co.'s No. 1 Hamilton, C Sec. 6, Blk. D-7, E.L.&R.R. Sur. .....Shut down 1,749 ft.
Mrs. J. B. McPhee's No. 1 Sam Belt, Cen. Sec. 78, Blk. D-7, E.L.&R.R. Sur. .....Location.
Milham Exploration Co.'s No. 1 Bassett, Sec. 76, Blk. Y, W. E. Robertson Sur. .....Cem. 6⅝-in. casing 3,986 ft.; cem. cave 4,140 ft.; drlg. 4,330 ft.

Woodley & Jones No. 1 Pankenham, C SE NW Sec. 43, Blk. B-2, C.C.S.D.&N.G.R.R. Sur. .....Shut down 150 ft.

TERRY COUNTY

Kingsland O. & P. Co.'s No. 1 Brownfield, C NW SW SW Sec. 7, Blk. 1-A, E.L.R.R. Sur.....Underreaming 5 3/16-in. casing 4,430 ft.

TOM GREEN COUNTY

Collins et al's No. 1 Jones, CSL Sec. 646, Shaffer Sur.....Shut down 1,800 ft.
Fitzgerald & Taliaferro's No. 1 Bennett, C SW Sec. 1,628, E. H. Ringer .....Shut down 1,920 ft.
F. P. Green et al's No. 1 fee, 575 ft. from N and 1,450 ft. from W lines Sec. 165, District 11, S.P.R.R. Co. Sur. .....Shut down 1,066 ft.; rigging up new machinery.

McLaughlin & Ridge's No. 1 R. Q. Holder, 3,140 ft. N and 80 ft. W SE cor. J. P. Parker Sur. (3,000-ft. test) .....Show gas 1,757-59 ft.; shut down 3,005 ft.; hole full water 2,986 ft.

Tulsa Oil Co.'s No. 1 Adams, C SW Sec. 163, Blk. 11, S.P.R.R. Sur. .....Shut down 1,050 ft.

UPTON COUNTY

Champlin Oil & Ref. Co.'s No. 4 J. F. Lane, 990 ft. from S. 330 fet. From W line of SE Sec. 2, G.C.&S.F. Sur...Straightreaming 1,972 ft.; 800 ft. fluid in hole, 90 per cent water.

Gulf Prod. Co.'s No. 7 J. F. Lane, 990 ft. N and 326 ft. W of most southerly SE cor. of their 160-acre tract Sec. 3, G.C.&S.F. Sur. .....Top salt 475 ft.; 250,000 ft. gas 2,700 ft.; setting 10-in.; drlg. 2,025 ft.; 800 ft. oil in hole.

Keck Investment Co.'s No. 1 H. L. McClintic, 330 ft. S and W NE cor. Sec. 206, Blk. F, C.C.S.D.&R.N.G. Sur. .....Top salt 1,100 ft.; top lime 2,725 ft.; set 10-in. casing; drlg. 2,731 ft.; gas show 2,700 ft.

VAL VERDE COUNTY

Independent Operators' No. 1 Whitehead, SE SE Sec. 30, Blk. 4, I.&G.N. Sur., elev. 1,175 ft. .....Drlg. 4,480 ft.
O. O. Owens' No. 1 Mills, Sec. 128, Blk. 1, I.&G.N. Sur., elev. 2,130 ft. .....Gas sand 2,491-2,520 ft., tested 125,750 ft. gas; reset 8-in. 2,511 ft.; shut down 4,210 ft.

Producers Oil Co. et al's No. 1 Everett Bros., 2,310 ft. S and 330 ft. E of NW cor. Sec. 40, Blk. DB, C.C.S.D.R.G.N.G. Sur. .....Drlg. 735 ft.

Dyar Brothers et al's No. 1 Wilson, 6,830 ft. N NE cor. Sec. 1, T.&P. Sur., thence 1,680 ft. E Sec. 115, Blk. E, G.C.&S.F. Sur. .....Show oil and gas 1,055 ft.; drlg. 1,400 ft.

Valvert Oil Corp.'s No. 1 Bassett, C NE Sur. 47, Blk. Y...Set 15½-in. casing 767 ft.; fishing 1,204 ft.

WARD COUNTY

Denver P. & R. Co.'s No. 1 Cherokee Land & Investment Co., 990 ft. from NEL and 2,310 ft. from SEL Sec. 215, Blk. 34, H.&T.C. Sur. (4,000-ft. test).....Set 8¼-in. casing 2,505 ft.; top salt 2,755 ft.; 800 ft. salt water 4,701-03 ft.; total depth 4,703 ft.

E. B. Lovelace et al's No. 1 Redman, 1,980 ft. NE of SW line and 1,980 ft. SE of NW line, Sec. 162, Blk. 34, H.&T.C.R.R. .....Spudding and shut down.
Prairie Oil & Gas Co.'s No. 1 Sealy Estate, 1,320 ft. S and W Sec. 95, Blk. A, G.M.M.B.&A. Sur. .....Top salt 1,073 ft.; 5,000,000 ft. gas 2,526 ft.; gas decreased to 2,000,000 ft. at 2,637 ft.; shut down 3,014 ft.; oil show 3,010-14 ft.

Rector Oil Co.'s No. 1 Johnson, 1,150 ft. NW, 5,610 ft. NE, Sec. 10, Blk. 32, H.&T.C. .....Top salt 745 ft.; total depth 2,662 ft.

Shipley et al's No. 1 Hazlett, 2,310 ft. NE and 2,310 ft. SE Sec. 17, Blk. 5, H.&T.C. .....Top salt 727 ft.; sand pay 2,486-81 ft.; flowing about 100 bbls. every 36 hrs.

Talbot, Dittman & Atlantic O. P. Co.'s No. 1 Dorr, 1,320 ft. from SE line and 660 ft. from SW line of Sec. 9, Blk. 5, H.&T.C. R. R. Sur. .....Drlg. 212 ft., red beds.

WINKLER COUNTY

Anderson et al's No. 1 Hendricks, NW NE SE Sec. 3, Blk. B-12 .....Drlg. 400 ft.
Atlantic O. P. Co. et al's No. 2 Daugherty, 2,310 ft. N and E of SW cor. Sec. 3, Blk. 74, Public School Land..Top lime 2,668 ft.; cem. 8¼-in. casing 2,673 ft.; drlg. 2,999 ft.; spray oil 2,968-69 ft.

Amerada Pet. Corp.'s No. 3 Cowden, 1,320 ft. S and 1,650 ft. E of NW cor. Sec. 3, Blk. B-12, School Land..Location.
Amerada Pet Corp.'s No. 1 L. Daugherty, 2,310 ft. N and W of SE cor. Sec. 3, Blk. 74, Public School Land..Top lime 2,648 ft.; set 8-in. casing 2,653 ft.; oil show 2,729 ft.; drlg. 2,968 ft.; oil show 2,92[illegible] 23 ft.

Amerada Pet. Corp.'s No. 2 Daugherty, SW cor. SE Sec. 3, Blk. 74 .....Drlg. 960 ft.
Amerada Pet. Corp.'s No. 3 Daugherty, NW cor. NE SE Sec. 3, Blk. 74 .....Rigging.
V. T. Bolin et al's No. 2 Brown, 2,000 ft. S and W of NE cor. Sec. 4, Blk. B-5, Public School Land.....Rigged up rotary and shut down.
Barnsdall Oil Corp.'s No. 1 Tobe Morton, 330 ft. N and E of SW cor. Sec. 26, Blk. B-12.....Cored salt 2,747-65 ft. and 2,8[illegible] ft.

Barnsdall Oil Corp.'s No. 2 Tobe Morton, 1,650 ft. N and 330 ft. E of SW cor. Sec. 26, Blk. B-12.....Set 12½-in. casing 547 ft.
Barnsdall Oil Corp.'s No. 3 Tobe Morton, 990 ft. N and 330 ft. E of SW cor. Sec. 26, Blk. B-12 .....Location.
Cranfill & Reynolds' No. 1 Hendricks-F, 660 ft. S and 2,310 ft. E of NW cor. Sec. 16, Blk. 26 .....Top salt 1,985 ft.; drlg. 2,835 ft.; anhydrite.

Cranfill Bros. & Pickrell's No. 1 Hutchins, 2,310 ft. N and 330 ft. E of SW cor. Sec. 47, Blk. 26.....Top lime 2,280 ft.; drlg. 2,960 ft.; lime; oil show 2,930 ft.; 400 ft. oil.

Culberson Bros.' No. 1 Hendricks, 1,650 ft. N and W of SE cor. Sec. 40, Blk. B-5, School Land.....Top lime 2,270 ft.; cem. 8-in. casing 2,272 ft.; rigging up standard tools.

Empire Gas & Fuel Co.'s No. 2 Daugherty, 330 ft. N and 2,310 ft. E of SW Sec. 3, Blk. 74 .....Cem. 12½-in. casing 262 ft.
Empire Gas & Fuel Co.'s No. 3 Daugherty, 330 ft. N and 990 ft. E of SW cor. Sec. 3, Blk. 74 .....Cem. 12½-in. casing 251 ft.
Empire Gas & Fuel Co.'s No. 1-B Daugherty, 2,310 ft. S and 990 ft. W of NE cor. Sec. 3, Blk. 74 .....Spudding.
Flandell & Co.'s No. 1 Carter, 640 ft. S, 330 ft. W Sec. 26, Blk. B-3. .....Set 12½-in. casing 272 ft.; shut down 400 ft.

Gulf Prod. Co.'s No. 2 O'Brien, NW cor. Sec. 31, Blk. F..Fishing stem 1,860 ft.
Gulf Prod. Co.'s No. 3 O'Brien, Sec. 31, Blk. F .....Drilling 924 ft.
Gulf Prod. Co.'s No. 1 Ida Hendricks, SE cor. NW, Sec. 44, Blk. 26 .....Drlg. 1,485 ft.
Independent O. & G. Co.'s No. 3 McCabe, 990 ft. S and 2,310 ft. W of NE cor. Sec. 36, Blk. B-5, School Land..Top salt 950 ft.; top lime 2,[illegible] ft.; oil show 2,515 ft.; rigging up standard tools 2,831 ft.

Magnolia Pet. Co.'s No. 1 Scarborough, 2,310 ft. S and 990 ft. E Sec. 1, Blk. C-22.....Top salt 1,122 ft.; drlg. 2,140 ft.
Marland Oil Co.'s No. 1 Tobe Morton, SE cor. Sec. 27, Blk. B-12 .....Spudding.
Marland Oil Co.'s No. 2 Tobe Morton, 990 ft. N and 330 ft. W of SE cor. Sec. 27, Blk. B-12 .....Location.
May Prod. Co.'s No. 1 Hendricks, 1,320 ft. N and 2,310 ft. W of SE Sec. 34, Blk. 26, Public School Land.....Top lime 2,449 ft.; drlg. 2,900 ft.; hole full oil; top pay 2,769 ft.

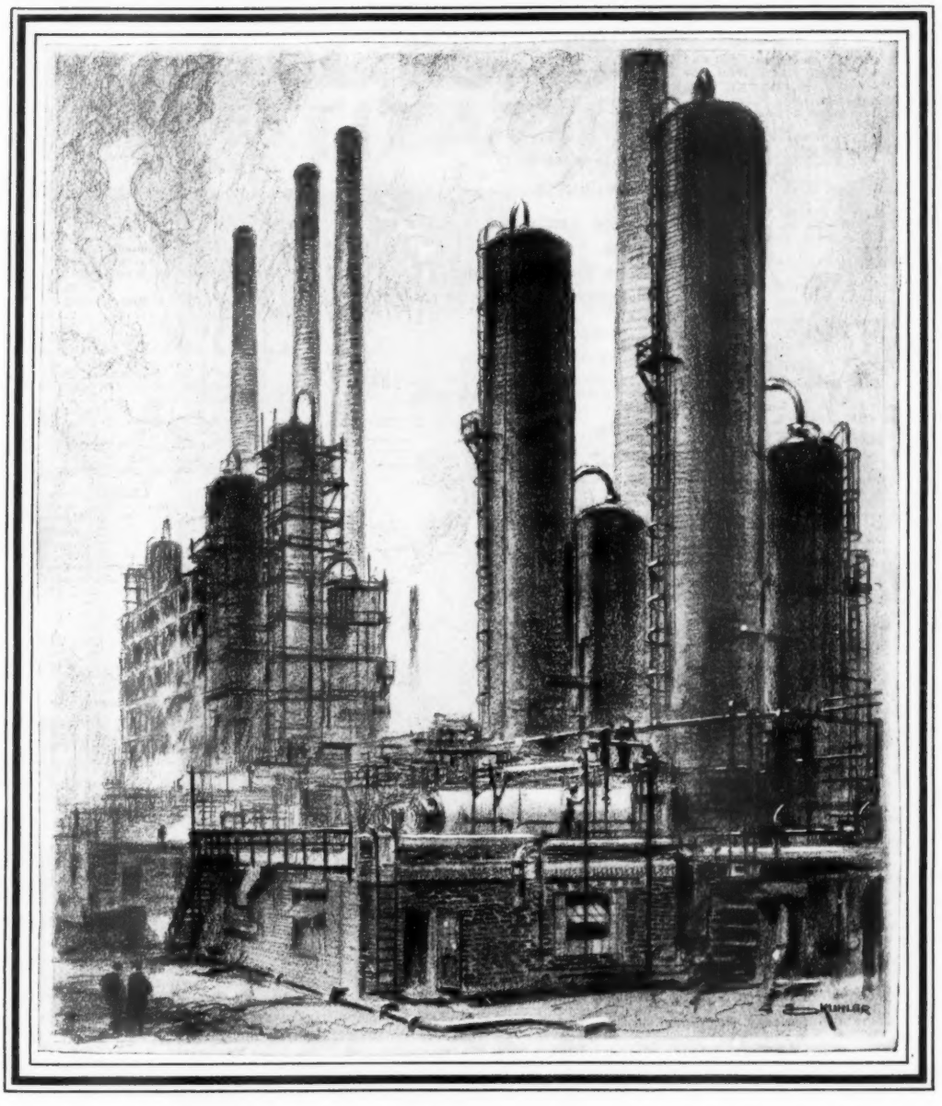
Prairie Oil & Gas Co.'s No. 2 Cowden, 1,320 ft. N and 330 ft. E of SW cor. Sec. 3, Blk. B-12.....Cem. 8¼-in. casing 2,518 ft.; top lime 2,518 ft.; gas show 2,[illegible] ft.; drlg. 2,780 ft.

Prairie Oil & Gas Co.'s No. 3 Cowden, 2,200 ft. N and 990 ft. E of SW cor. Sec. 3, Blk. B-12.....Drlg. 854 ft.
Prairie Oil & Gas Co.'s No. 1 Leck, 330 ft. S and 2,310 ft. E of NW cor. Sec. 16, Blk. 74 .....Rig.
Prairie O. & G. Co.'s No. 2 Leck, 330 ft. S and 2,310 ft. W of NE cor. Sec. 16, Blk. 74 .....Rig.
Prairie Oil & Gas Co.'s No. 1 Tobe Morton, 330 ft. N and 1,650 ft. W of SW cor. Sec. 27, Blk. B-12 .....Rig.
Roxana-The Texas Company's No. 6-A Cowden, 1,320 ft. S and 990 ft. E of NW cor. of Sec. 3, Blk. B-12, School Land .....Drlg. 345 ft.
Roxana Pet. Co.'s No. 1 Daugherty, 2,310 ft. S and W of NE cor. Sec. 3, Blk. 74 .....Drlg. 609 ft.
Roxana Pet. Co. et al's No. 2 Lum Daugherty., 2,310 ft. S and 1,650 ft. W of NE Sec. 3, Blk. 74 .....Rigging up rotary.
Simms Oil Co. and Southwest O. P. Co.'s No. 1 George Sealey, 2,434 ft. S and 330 ft. W of NE cor. Sec. 50, Blk. F .....Cellar.
Southern C. O. P. Co.'s No. 3 Hendricks T-67-2-D, 1,650 ft. S and 330 ft. W of Sec. 28, Blk. 26.....Cem. 12½-in. casing 468 ft.; top lime 2,639 ft.; total depth 1[illegible] ft.; rigging up standard tools.

Southern C. O. P. Co. and Westbrook-Thompson's No. 3 Hendricks T-88-T, Sec. 34, Blk. 26, Public School Land .....Top lime 2,452 ft.; set 8-in. casing 2,473 ft.; drlg. 3,110 ft.

Southern C. O. P. Co. and Westbrook-Thompson's No. 2 Hendricks T-88-R, 1,320 ft. N and 330 ft. E of SW cor. Sec. 27, Blk. 26 .....Top lime 2,300 ft.; cem. 2,320 ft.; bailing casing 2,320 ft.; [illegible] 2,614 ft.; gas show 2,614 [illegible] 15,000,000 ft. gas.

Southern C. O. P. Co. and Westbrook-Thompson's No. 1 Hendricks T-88-Q, 440 ft. N and 330 ft. E of SW cor. of N half Sec. 27, Blk. 26 .....Drlg. 1,073 ft.
Southern C. O. P. Co. and Westbrook-Thompson's No. 3 Hendricks T-89-C, 2,310 ft. N and W of SE cor. Sec. 35, Blk. B-5 .....Drlg. 1,019 ft.



REFINERY CONDITIONS ARE ALWAYS DIFFERENT
HENCE REFINERIES MUST BE TAILOR-MADE

Nature produces crudes in endless variety. Each one has a combination of characteristics exclusively its own. An accurate fore-knowledge of the peculiarities of the crudes to be handled should always precede the designing of refinery equipment.

Kellogg oil technologists possess an experience with crudes from the oil fields of the world, and have at their command laboratory facilities for making actual runs of any oil. Kellogg refinery equipment is tailor-made, with exact fore-knowledge of the service that it will render.

The M. W. KELLOGG COMPANY
7 DEY STREET, NEW YORK

HOUSTON, TEXAS, 1514 PETROLEUM BLDG. SAN FRANCISCO, CAL., 444 MARKET STREET
LOS ANGELES, CAL., 329 PETROLEUM SECURITIES BLDG.

TEXAS PANHANDLE WILDCATS

(Continued from Page 47)

CHILDRESS COUNTY

C. L. Sloane et als' No. 1 B. P. Smith, Sur. 49, F. P. Knott lands ..... S.D. 4,005 ft.
The Texas Co.'s No. 1 Smith, 100 ft. each way from NW cor. Sec. 174, Blk. H, W.&N.W. Sur. ..... Drlg. 3,940 ft.

COCHRAN COUNTY

Clark & Melat's No. 1 C. C. Slaughter, 1,650 ft. E and 660 ft. S of NW tract, League 118, Knox County School land ..... Rig blown down.
Marland Prod. Co.'s No. 1 C. C. Slaughter, 330 ft. from S and W lines, Carson County School land, Tr. 130 .. Fish. 1,550 ft.

COTTLE COUNTY

Explin. Co.'s No. 1 Richards ..... Drlg. 500 ft.
Explin. Co.'s No. 4 Matador Land & Cattle Co., C, Sec. 46, J. H. Stephens Sur. ..... Drlg. 1,895 ft.
Skelly Oil Co.'s No. 1 J. H. Cannon ..... H.F.W. 3,558 ft; drlg. 3,645 ft.
Sun Oil Co.'s No. 1 T. B. Yarborough, 485 ft. S and 2,460 ft. E of NW cor. Sec. 551, Blk. H, W.&N.W. Sur.. Drlg. 3,200 ft.

FLOYD COUNTY

Explin. Co.'s No. 1 S. H. Boone, C. C. H. Johnson Sur. .. S.D. 4,015 ft.

GRAY COUNTY

Adams Oil Co.'s No. 2 Morse, 330 ft. from E line and 990 ft. from S line, Sec. 3, Blk. 26, H.&G.N.R.R. Sur.. Drlg. 2,458 ft.
B. S. Arnold's No. 1 J. E. Mingale, cen. east 160 acres, Sec. 212, Blk. B-2, H.&G.N. Sur. ..... Rig.
Arnold & Howell's No. 1 Turnex, C SW, Sec. 111, Blk. B-2 ..... S.D. 2,224 ft. for pipe.
Biggs et als' No. 1 Morse, SW cor. Sec. 3, Blk. 26, H. &G.N Sur. ..... 10,000,000 ft. gas 2,192-2,250 ft; C.O. 2,590 ft.

Camel Oil Co.'s No. 1 Harrah-B, 330 ft. each way from NW cor. NE, Sec. 150, Blk. 3, I.&G.N.R.R. Sur. .... Cellar.
Crabtree Drlg. Co.'s No. 1 B. F. Talley, SW NE, Sec. 114, Blk. M-2, B.S.&F. Sur. ..... S.O. 2,400 ft; S.D. 2,735 ft.
Danciger et als' No. 1 Shaw, 1,000 ft. N and 330 ft. W SE cor. SW, Sec. 5, Blk. 1, A.C.H.&B. Sur. ..... 35,000,000 ft. gas 2,290 ft; show oil 2,610-13 ft; S.D. 2,683 ft.

Danciger O. & R. Co.'s No. 3 J. S. Morse, 330 ft. each way from NE cor. SW, Sec. 2, Blk. 26, H.&G. N.R.R. Sur. ..... Drlg. 2,337 ft.
Delmar Oil Co.'s No. 1 F. Foster, NW cor. SW, Sec. 55, Blk. B-2, H.&G.N. Sur. ..... Show oil; 4,000,000 ft. gas 2,835-97 ft; T.D. 3,757 ft; to plug back to 2,950 ft. and shoot.

Eslick & McKinney's No. 1 Mrs. Hopkins, 330 ft. from NE, E ½ NE, Sec. 84, Blk. B-2, H.&G.N. Sur. ..... Spud.
Sines & Reiger's, formerly Eslick et als' No. 1 Mrs. J. A. Hopkins, NW cor. W 80 acres of SW, Sec. 84, Blk. B-2, H.&T.C. Sur. ..... S.D. 3,206 ft.
Get Oil Co.'s No. 1 LeFors Townsite, 765 ft. from E line and 1,397 ft. from S line, being center of Lot 16, Blk. 5 ..... Derrick.
Gulf Prod. Co.'s No. 6 J. B. Bowers-A, 330 ft. S and E of NW cor. W ½, Sec. 89, Blk. B-2, H.&G.N. Sur. ... Drlg. 1,867 ft.
Gulf Prod. Co.'s No. 3 Holmes-A, 330 ft. N and E of SW cor. W½ SE, Sec. 87, Blk. 3, I.&G.N. Sur. ..... Top lime 2,321 ft; drlg. 3,065 ft.
Gulf Prod. Co.'s No. 4 Holmes-A, 990 ft. N and 330 ft. E of SW cor. W ½ SE, Sec. 87, Blk. 3, I.&G.N. R.R. Sur. ..... Location.
Gulf Prod Co.'s No. 1 McLarty, 150 ft. N and 482 ft. W of SE cor. NE, Sec. 2, Blk. 1, A.C.H.&B. Sur. .... Drlg. 2,480 ft.
Gulf Prod. Co.'s No. 1 Saunders, 990 ft. N and 330 ft. E of SW cor. Sec. 3, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 2,038 ft.
Gardner Bros. et als' No. 1 Ball, 323 ft. from N line and 350 ft. from E line of W 186.3 acres of N¼, Sec. 3, Blk. B-2, H.&G.N. Sur. ..... Flowed 85 bbls. 2,696-2,741 ft.; drlg. 2,765 ft.

Gardner, Collins et als' No. 1 Saunders, 330 ft. each way from NE cor. of S 49 acres of W 100 acres, Sec. 3, B.&B. Sur. ..... Spud.
LeFors Pet. Co.'s No. 3 Shaw, 990 ft. S and 375 ft. E of NW cor. T. Leach Sur. ..... 30,000,000 ft. gas 2,075-2,340 ft; oil pay 2,631-43 ft; salt wtr. 2,655-60 ft; made 300 bbls. fluid 50% wtr.

LeFors Pet. Co.'s No. 8 Shaw, 288 ft. from N line and 1,091 ft from E line of T. Leach Sur. ..... Drlg. 2,280 ft.
LeFors Pet Co.'s No. 3 J. M. Shaw, 295 ft. from N line and 271 ft. from E line of Leach Sur. ..... Rig.
LeFors Pet. Co.'s No. 4 J. M. Shaw, 1,650 ft. from S line and 375 ft. from W line, T. Leach Sur. ..... Drlg. 1,490 ft.
Magnolia Pet. Co.'s No. 2 Archer, SE N½ SE Sec. 174, Blk. 3 ..... Drlg. 2,365 ft.
Magnolia Pet. Co.'s No. 2 W. Harrah, 990 ft. from N line and 330 ft. from W line of NW, Sec. 150, Blk. 3, I.&G.N. Sur. ..... Drlg. 3,228 ft; 1,700 ft. oil 3,110 ft.
Magnolia Pet. Co.'s No. 3 W. Harrah, 330 ft. from NE cor. NW, Sec. 150, Blk. 3, I.&G.N. Sur. ..... Rig.
Magnolia Pet. Co.'s No. 1 Gething, 530 ft. each way from SE SW Sec. 14, Blk. A-9, H.&G.N. Sur. ..... Rig.
Magnolia Pet. Co.'s No. 1 Saunders, 330 ft. from SE W½ of NW, Sec. 4, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 2,450 ft.
McElroy Oil Co.'s No. 2 Bruce Bull, 155 ft. from N line and 240 ft. from W line of E 87.3 acres of Sec. 3 Blk. B-2, H.&G.N.R.R. Sur. ..... Drlg. 1,900 ft.
McMan O. & G. Co.'s No. 2 Binkley, 330 ft. each way from NW cor. W½ SE cor. Sec. 86, Blk. 3, I.&G. N. Sur. ..... Drlg. 3,124 ft.
Midwest Explin. Co.'s No. 2 L. Holmes, 330 ft. from N and 357 ft. from E lines, SW, Sec. 86, Blk. 3.... Swb. 5 bbls. per hr., 5 pct. wtr. at 3,127-62 ft; T.D. 3,265 ft; C.O.

Osborn et als' No. 1 E. E. Barrett, SE cor. NE, Sec. 111, Blk. 3, I.&G.N. Sur. ..... Fishing 3,275 ft.
Parton & Holt's No. 1 Gething, 330 ft. each way from SE cor. NE Sec. 14, Blk. A-9 ..... Rig.
Phillips Pet. Co.'s No. 4 Johns, 330 ft. each way from NE cor. SE SW Sec. 87, Blk. 3, I.&G.N. Sur. ..... Bldg. rig.
Phillips Pet. Co.'s No. 1 Bob Olsen, NW cor. S½, Sec. 64, Blk. B-2 ..... T.D. 3,239 ft; plugged back to 3,230 ft; shot with 440 qts. at 3,-119-3,222 ft; 600 ft. oil and 60 ft. wtr. in hole; drlg. 3,425 ft.

Plains Drlg. Co.'s No. 2 Saunder, 990 ft. from S line and 330 ft. from E line of E ½ SE, Sec. 4, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 235 ft.
Pure Oil Co.'s No. 8 Davis, 330 ft. from NW of NE. ..... Location.
Prairie O. & G. Co.'s No. 2 Reynolds, 330 ft. each way from NW cor. SE, Sec. 61, Blk. 3, I.&G.N. Sur. ..... Location.
Sec. 86, Blk. 3, I.&G.N.R.R. Sur. ..... Drlg. 3,025 ft.
Purple Sage Oil Co.'s No. 2 E. B. Johnson ..... 2,000,000 ft. gas; 200 ft. oil 2,870 ft; shot with 510 qts. 2,775-2,-372 ft.; 406 ft. oil; fish. 2,875 ft.

Republic Prod. Co.'s No. 1 G. H. Saunders, 330 ft. each way from SW cor. E½ NW cor. Sec. 4, Blk. 1, A. C.H.&b Sur. ..... Fish. 2,510 ft.
Schwald et als' No. 1 fee, 330 ft. each way from NE cor. E ½ SW, Sec. 1, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 1,720 ft.
Shamrock Oil Co.'s No. 1 W. S. Clayton, 866 ft. from NW cor of E 278.4 acres, Sec. 50, Blk. 25, H.&G.N.. Cmt. 8¼-in. csg. 2,196 ft. and S.D.
Skelly Oil Co.'s No. 1 Saunders, 330 ft. from E line, 990 ft. from S line, SW, Sec. 4, Blk. 1, A.C.H.&B. Sur. .. Rig.
Skelly Oil Co.'s No. 2 Saunders, 231 ft. from S line, 1,-124 ft. from W line, SW, Sec. 4, Blk. 1, A.C.H.&B. Sur. ..... Rig.
Skelly Oil Co.'s No. 3 Saunders, 330 ft. from N line and 990 ft. from W line, SW cor., Sec. 4, Blk. 1, A.C. H.&B. Sur. ..... Rig.
Skelly Oil Co.'s No. 4 Saunders, 330 ft. from N line and 990 ft. from E line, SW cor., Sec. 4, Blk. 1, A. C.H.&B. Sur. ..... Rig.
St. Clair Oil Co.'s No. 1 Rowe, Sec. 32, Blk. R. ..... S.D. 1,600 ft.
St. Clair Oil Co.'s No. 1 L. S. Stockton, SE cor. Sec. 35, W. R. Lee Sur. ..... Spudded and S.D.
The Texas Co.'s No. 5 A. Chapman, 1,138 ft. from W and 330 ft. from S lines, SE, Sec. 51, Blk. 25, H. &G.N. Sur. ..... Cellar.
The Texas Co.'s No. 3 Davis, 990 ft. from E line and 330 ft. from N line NW, Sec. 86, Blk. 3, I.&G.N. Sur. .. Drlg. 3,172 ft.
The Texas Co.'s No. 3 M. B. Davis, 2,309 ft. from S line and 2,212 ft. from E line, Sec. 8, Blk. 1, A.C. H.&B. Sur. ..... Drlg. 2,485 ft.
The Texas Co.'s No. 4 H. M. Davis, SE cor. NW, Sec. 86, Blk. 3, I.&G.N. Sur. ..... Drlg. 2,310 ft.
The Texas Co.'s No. 3 McLarty and Lester-A, 330 ft. from NE W½ SW, Sec. 1, Blk. 1, A.C.H.&B. Sur. .... Spraying 10 bbls. 2,490-2,510 ft; drlg. 2,544 ft.

The Texas Co.'s No. 1 Bull, 1,043 ft. from N and 330 ft. from E lines, Sec. 2, Blk. B-2, H.&G.N. Sur. ..... Drlg. 2,612 ft.
The Texas Co.'s No. 8 Saunders, 895 ft. N and 2,060 ft. E of SW cor. Sec. 3, B.&B. Sur. ..... Location.
The Texas Co.'s No. 9 Saunders, 330 ft. S and 3,016 ft. E of NW cor. Sec. 1, Eustis Sur. ..... Location.
The Texas Co.'s No. 7 Saunders, 990 ft. from S line and 330 ft from W line of W½ SE cor. Sec. 4, Blk. 1, A.C.H.&B. Sur. ..... Rig.
Travis et als' No. 1 J. S. Morse, SE NW SW, Sec. 68, Blk. 25, H.&G.N. Sur. ..... S.D. 2,580 ft.
Ware et als' No. 1 fee, 990 ft. from N and 400 ft. from W lines, Sec. 18, Blk. 3, A.&B.M. Sur. ..... Rig.
Wilcox Pampa Oil Co.'s No. 30 Wooley & Reynolds, NW SE NW, Sec. 61, Blk. 3. ..... Fish. for tools 2,954 ft.
United Eight O. & T. Co.'s No. 1 E. B. Clay, SE cor. W½ SW, Sec. 177, Blk. B-2. ..... Spraying 5 bbls. daily 3,022-40 ft.

HALL COUNTY

Rio Bravo Oil Co.'s No. 1 Hughes est., 950 ft. from N line, 150 ft. from E line, Sec. 39, Blk. H, I. A. Stephens Sur. ..... Set 6-in. 3,500 ft; S.D. 4,000 ft.

HOCKLEY COUNTY

World Oil Co.'s No. 1 Ellwood, 320 ft. from N and W lines, League 7, Wilbarger County school lands; elevation 3,363 ft; contract depth, 5,000 ft. ..... S.D. 1,455 ft.

HARTLEY COUNTY

Amarillo Oil Co.'s No. 9 Lee Bivins "A," C NW, Sec. 6, Blk 21 ..... 15,000,000 ft. gas 3,300-35 ft; T.D. 3,601 ft. to deepen.

HUTCHINSON COUNTY

R. G. Barnum et als' No. 1 Garland Sanford, Sec. 78, Blk. 4 ..... S.O. 2,920 ft; S.D. 3,020 ft.
Devonian Oil Co.'s No. 9 Johnson Bros., 330 ft. S and W of NE cor. of Lot 3, Johnson Bros. Subdivision, M. Whitley Sur. ..... Drlg. 2,345 ft.
Dunnigan et als' No. 1 C. W. Hugenbyhl, 330 ft. from S line and 330 ft. from E line, N½, Sec. 4, Blk. T. W.N.G.R.R. Sur. ..... Rig.
Oil Operators Trust Co. and Marland's No. 2 J. M. Stanford-B, Sec. 82, Blk. 46, H.&T.C. Sur. ..... S.D. 3,039 ft.
Phillips Pet. Co.'s No. 12 Elva Whittenburg, E. Tomlinson Sur. ..... S.D. 5,333 ft.
Phillips Pet. Co.'s Johnson Bros. (Florence) 412 ft. from W and 270 ft. from N lines, Tract 2, of Geo. Montgomery Sub-div. of Mary Whitley Sur. .... Rebldg. rig.
Phillips Pet. Co.'s No. 19 Perkins-Martin, 990 ft. S and 330 ft. E of NW cor. of W 240 acres of S 320 acres of Sec. 1, Blk. X02, H.&O.B. Sur. ..... Drlg. 1,455 ft.
Phillips Pet. Co.'s No. 1 Sanford-Garford, 330 ft. N and E of SW cor. N 40 acres of E 80 acres of S 160 acres of S 320 acres, Sec. 77, Blk. 46, H.&T. C.R.R. Sur. ..... Drlg. 2,127 ft.
Premier O. & G. Co.'s No. 1 L. E. Borton, C NE NW NW, Sec. 32, Blk. Y, A.&B. Sur. ..... Rigged up and S.D
Rock Creek Oil Co.'s No. 2 Johnson, 330 ft. from N and W lines SW SE, Sec. 28, Blk. Y, A.&B. Sur. ..... S.D. 2,700 ft.
Sand Creek Oil Co.'s No. 2 J. H. Jasper, 320 ft. from S line and 387 ft. from W line of 100-acre lease, Sec. 23, Blk. M-23, T.C. Sur. ..... T.D. 3,148 ft; P.B. to 3,136 ft; shot with 220 qts. 3,036-3,136 ft; T.P. 300 bbls. fluid 50% wtr.; C.O.

Timms et als' No. 2 Garner, 990 ft. S and 330 ft. E of NW cor. J. W. Proctor Sur. ..... Fish. 1,140 ft.
Wendell et als' No. 1 Johnson Bros., Sec. 1, Blk. X02. .. Set 10-in. csg. 2,035 ft; S.D.
White Eagle Oil Co.'s No. 4 Johnson Bros. (Montgomery) 330 ft. from N and W lines E½, Tract 2, Geo. Montgomery Sub-div. of Mary Whitley Sur. ..... S.D. 2,100 ft.

KING COUNTY

Humble O. & R. Co.'s No. 1 Pitchfork, Sec. 171, Blk. A-96, John H. Gibson Sur. ..... Drlg. 4,720 ft.
The Texas Co.'s No. 1 J. H. Johnson ..... Pulling 6-in. csg. 4,040 ft.

LAMB COUNTY

Dan Freel et als' No. 1 Ellwood, CWL, Sec. 9, Blk. T, T. A. Thompson Sur. ..... Spudded and S.D.

LUBBOCK COUNTY

Center Oil Co.'s No. 1 Bowles ranch ..... Small show oil 1,133-40 ft; sand S.D. 3,943 ft.

MOORE COUNTY

Barnsdall Oil Corp.'s No. 1 L. R. Hagy, NW cor. Thomas Ross Sur. ..... Drlg. 2,800 ft.
Canadian Gas Co.'s No. 1 Kilgore-A, 2,710 ft. S and 2,-650 ft. W of NE cor Sec. 1, Eustis Sur. ..... Location.
Devonian Oil Co.'s No. 1 J. Sneed, Jr., 2,235 ft. from E and 330 ft. from S lines, S 160 acres, N 320 acres of Matilda Robinson Sur. ..... Drlg. 600 ft.
Dixie Creek Oil Co.'s No. 1-A Sneed, Jr., 330 ft. N and W of SE cor. E½, Sec. 65, Blk. 3, G.M. Sur. ..... Drlg. 2,500 ft.
Dixie Creek Oil Co.'s No. 4-A Sneed, Jr., 330 ft. S and W of NE cor. E½, Sec. 65, Blk. 3 ..... Drlg. 2,345 ft.
Fritch O. & G. Co.'s No. 1 Lee Buns, C NE 40 acres of N 160 acres, Sec. 4, Geo. Mahan Sur. ..... Spudded and S.D.
McMan O. & G. Co.'s No. 1 Sneed, 2,260 ft. S and 330 ft. W of NW cor. J. W. Proctor Sur., but in Matilda Robinson Sur. ..... Fish. 2,289 ft.
Phillips Pet Co.'s No. 1 J. T. Sneed (James) 330 ft N and W of SW cor. P. Bazemore Sur. ..... Drlg. 2,642 ft; show gas 2,625 ft.
Phillips Pet. Co.'s No. 2 J. T. Sneed, 660 ft. S and 330 ft. W NW cor. J. H. Proctor Sur. ..... Stdgnz. 2,253 ft.
Phillips Pet. Co.'s No. 3 Sneed (James), 600 ft. S and 330 ft. W of NW cor. J. W. Proctor Sur., but in Matilda Robinson Sur. ..... Drlg. 1,100 ft.
Skelly Oil Co.'s No. 4 Armstrong & Byrd, 1,600 ft. S and 330 ft. E of NW cor. J. W. Proctor Sur. ..... Top lime 2,317 ft; 9,500,000 ft gas 2,550 ft; setting 6⅝-in. csg. 2,970 ft.

Skelly Oil Co.'s No. 5 Armstrong & Byrd, 2,260 ft. S and 330 ft. E of NW cor. J. W. Proctor Sur. ..... Drlg. 1,290 ft.

MOTLEY COUNTY

Explin. Co.'s No. 1 Tillson ..... S.D. 750 ft. for repairs.
Explin. Co.'s No. 2 Matador Land & Cattle Co., C SW Sec. 37, John Gibson Sur. ..... S.D. 4,000 ft.

ROBERTS COUNTY

Big Bend Oil Co.'s No. 1 Ledrick, Sec. 7, Blk. 5-A ..... Formerly abd. at 5,240 ft; small show 36 grav. oil 5,288-91 ft; shale cave 5,710 ft; run. liner

WHEELER COUNTY

Angus et als' No. 2 Morgan, C E½ NW NE, Sec. 93, Blk. 17, H.&G.N. Sur. ..... S.D. 1,050 ft.
Arnold Oil Co. et als' No. 1 Ritchey, 420 ft. from E and 460 ft. from S lines of NW cor., Sec. 5, Blk. 24, H.&G.N. Sur. ..... Rig.
Byrens et als' No. 1 Johnson, SW cor. NE, Sec. 88, Blk. A-5, H.&G.N. Sur. ..... Drlg. 2,500 ft.
Canadian River Oil Co.'s No. 2 Williams-Laycock, C SW of NW, Sec. 2, Blk. 27, H.&G.N. Sur. ..... Location.
Chapman & Morgan's No. 1 Otis Hatcher, NW cor. SW SW, Sec. 63, Blk. 17, H.&G.N. Sur. ..... S.D. 715 ft.
Lone Star Co.'s No. 1 Ackley, C NE NE, Sec. 20, Blk. 24, H.&G.N. Sur. ..... Drlg. 1,837 ft.
Lone Star Co.'s No. 1 Hicks, C SW NE, Sec. 52, Blk. 17, H.&G.N. Sur. ..... Rig.
Lone Star Co.'s No. 1 Shelton, C NE SE, Sec. 22, Blk. 24, H.&G.N. Sur. ..... Location.
Lone Star Gas Co.'s No. 2 Stuckey, C of W ½ of SE SW, Sec. 92, Blk. 17, H.&G.N. Sur. ..... Location.
Martin & Debon's No. 1 Gossett, C SE SE, Sec. 101, Blk. 23, H.&G.N. Sur. ..... S.D. 1,625 ft.
L. W. Rook's No. 1 M. Nelson, C SW NE, Sec. 5, Blk. 24, H.&G.N. Sur. ..... Fish. 1,950 ft.
L. W. Rook's No. 2 A. Smock, C SW SE, Sec. 5, Blk. 24, H.&G.N. Sur. ..... Rig.
Upham Gas Co.'s No. 1 Lamb, C N½ NE SW, Sec. 91, Blk. 17, H.&G.N. Sur. ..... S.D. 1,755 ft.
White et als' No. 1 J. M. Shelton, C SW NE, Sec. 100, Blk. 17 ..... Top lime 2,094 ft; drlg. 2,390 ft.

PRODUCTS OF SPECIALIZATION

Seamless

CASING

TUBING

STANDARD

DRILL PIPE

LINE PIPE

STILL TUBES

Sizes 2 inch to 13⅜ inch O. D.

Welded

STANDARD PIPE

CASING

TUBING

ETNA

LARGE O. D. PIPE

LINE PIPE

DRIVE PIPE

DRILL PIPE

Sizes ⅛ inch to 24 inch O. D.

SINCE 1828

SPANG, CHALFANT & CO., INC.

GENERAL OFFICES, CLARK BUILDING

PITTSBURGH, PA.

Sales Offices: CHICAGO, ILL. - NEW YORK, N. Y. - ST. LOUIS, MO.
PITTSBURGH, PENNA. - TULSA, OKLA. - LOS ANGELES, CALIF.
Mills: ETNA, PENNA. - SHARPSBURG, PENNA. - AMBRIDGE, PENNA.

MEN KNOWN IN OILDOM

A. W. Dingman

Among the pioneer oil operators still active in the Alberta, Canada, fields, Archibald Wayne Dingman is an outstanding figure. A native of Toronto, Ontario, Mr. Dingman as a boy learned the oil business in Pennsylvania and as a young man came to western Canada. He early became interested in the oil prospects of what were then the Northwest Territories. In 1891 he negotiated with the Dominion government regarding the development of oil prospects in northern Alberta, his backers in that venture including a number of prominent eastern men. In 1900 he drilled for gas on the Saskatchewan River flats within the limits of the present city of Edmonton.

Later, in 1910, Mr. Dingman transferred his attention to the Calgary district. He carried on drilling operations near that city, drilled on the Sarcee Reserve, and within the city limits brought in the Walker well, which supplied a limited number of customers with natural gas for fuel and lighting. In 1912 Mr. Dingman organized the Calgary Petroleum Products Company, which in August of that year started a test in the Turner Valley, later famous as the Dingman discovery well. In May, 1914, this well struck the show of light crude in the Turner Valley, which started the famous Calgary boom.

Since then Mr. Dingman has been intimately identified with the Turner Valley development. In the war years, after the boom collapsed, he continued to put all his energies and resources into the task of developing the Turner Valley Field, in the face of almost insuperable difficulties. Later, the Dingman interests were taken over by the Royalite Oil Company, an Imperial Oil, Ltd., subsidiary, and the drilling of Royalite No. 4 crude naphtha gusher definitely vindicated Mr. Dingman's faith in the field. The Dingman discovery well, now Royalite No. 1, is still producing.

Mr. Dingman's company, Calgary Petroleum Products, Ltd., constructed some 10 years ago the first gasoline absorption plant in Canada, to handle the wet gas production of the Dingman wells. His earlier natural gas enterprise at Calgary ultimately developed into the present Canadian Western Natural Gas, Light, Heat & Power Company, which supplies natural gas to a majority of the communities of southern Alberta.

PERSONAL PARAGRAPHS

J. E. Flanagan, head of The Texas Company's land department in Oklahoma and Kansas, was called to Wellsville, N. Y., by the death of a relative.

A. F. Melcher has returned to Tulsa after a visit of several weeks to the Kentucky fields.

* * *

F. H. Stacey, secretary of the Apex (Trinidad) Oilfields, Ltd., recovered from his recent indisposition.

* * *

Wilson Cross, director of the Vacuum Oil Company, left London recently on a trip to the United States.

* * *

G. W. Halse, chief geologist to the British Controlled Oilfields, Ltd., has been in London on a short vacation.

* * *

J. A. Talbot, president of the Richfield Oil Company of California, has returned to Los Angeles from a trip to New York.

* * *

F. P. Smith, Jr., asphalt specialist of the Union Oil Company, has returned to Los Angeles from a business trip to Australia.

* * *

George Cloakey, Jr., of the Seneca Oil Company, has returned to Calgary, Alberta, after spending several months in the East.

* * *

D. E. Buchanan, vice president of the Chestnut & Smith Corporation, has returned to Tulsa after spending a week at eastern points.

* * *

Dr. S. Zuber is making a further investigation of the oil deposits of Albania, where he now is on behalf of the Italian government.

* * *

F. G. Rappoport, general manager of the British Controlled Oilfields, Ltd., in Venezuela, has returned after a visit to England.

* * *

A. F. Castle, formerly of the North Venezuelan Petroleum Company, Ltd., has gone to Irak on behalf of the Turkish Petroleum Company, Ltd.

* * *

Mr. and Mrs. G. W. Currie and family of Petrolia, Ontario, are spending a month in New York State before returning to the Peruvian fields.

* * *

Dr. M. B. Blackler, manager of the government petroleum refinery at Suez, has been on a brief vacation in England, but has now returned to Egypt.

* * *

William Cole, who has been on the International Petroleum Company's staff at Pieta, Peru, is spending a few months at Petrolia, Ontario, on furlough.

* * *

Frank DeWolf, general manager of the Louisiana Land & Exploration Company, Houston, Tex., has been spending a short time in New York on a business trip.

* * *

J. C. Ballagh, of the Patterson-Ballagh Corporation, Los Angeles, Calif., was in Tulsa last week en route to Pittsburgh, Washington, D. C., and New York City.

* * *

E. B. Reeser, president of the Barnsdall Corporation, and J. A. Dunn, vice president, are making an inspection trip of the California properties of the company.

* * *

A. Beeby Thompson has returned to London from a month's tour of the Rumanian oil fields, where he was joined by Mr. Ashworth. Mr. Thompson afterwards visited Transylvania.

* * *

Fred E. Cooper, of Tulsa, special field representative for the Rumely oil pull tractor, has returned from Shreveport, La., where he attended the funeral of his nephew, George Cooper.

* * *

P. M. Longan, general manager of the Milham Exploration Company, of Los Angeles, has gone to New York on a three weeks' business trip. He stopped off at Houston, Tex., en route east.

* * *

W. H. Gaither, Houston, Tex., district manager of the National Transit Pump & Machine Company, spent several days the past week in Shreveport, La., and El Dorado, Ark., calling on the trade.

* * *

E. H. Leroux, president of the Oklahoma Pipe Line Company, is back at his headquarters at Muskogee, Okla., after a trip of inspection over the company's Seminole lines with a party of officials of the Standard Oil Company of New Jersey.

E. H. Roy, formerly superintendent of the Gainesville, Tex., plant of the Empire Oil & Refining Company and recently transferred to the operating offices of the company in Tulsa, returned to Gainesville for a week.

* * *

B. E. Hull, president of the Texas Pipe Line Company, has just completed an airplane inspection trip over the route of the proposed pipe line which that concern plans to construct from the Central Oklahoma fields to Chicago, Ill.

* * *

E. H. Patterson, of the land department of the Shell Petroleum Corporation (formerly Roxana Petroleum Corporation), Houston, Tex., is on a several week's leave of absence because of his health. He is spending part of the time resting in New Orleans, La.

* * *

E. F. Simms, head of the E. F. Simms Company, Houston, Tex., has returned following an extended visit to his blooded livestock farm in Kentucky and to New York. Although his home is at Houston, Mr. Simms spends a good part of his time on his Kentucky farm.

* * *

James K. Riley, of Coraopolis, Pa., district foreman for the Southwest Pennsylvania Pipe Line Company, for the past 38 consecutive years and previously connected with the United Pipe Line Company, has been placed on the retired list and he and Mrs. Riley will spend the winter in California.

* * *

W. D. Emery has announced his resignation from the Foxboro Company, effective November 1, to become associated with B. V. Emery & Company, Inc. Mr. Emery was formerly southwestern manager for the Foxboro Company. W. D. Emery is a cousin of B. V. Emery, president of the B. V. Emery & Company, Inc.

* * *

Dr. Gustav Egloff, of the Universal Oil Products Company, has returned to the United States after a visit of several weeks' duration at European points. Doctor Egloff attended the World Fuel Conference at London where he presented a paper. He is now in Washington, D. C., where he will be located for several weeks.

* * *

Herbert R. Straight, general manager of the Empire Gas & Fuel Company, and Fred K. Haskell, general manager of the Empire Pipe Line Company, have just returned to Bartlesville, Okla., after an airplane trip of inspection over the proposed right of way of the new Empire-Texas Company line from Cushing, Okla., to Lockport, Ill.

* * *

Dr. R. K. Richardson, chief geologist of the Anglo-Persian Oil Company, who is in charge of the oil survey party sent out to Papua by the company, acting in agreement with the Commonwealth government of Australia, has returned to Papua after having visited Sydney to deliver a report to the Federal government and make arrangements for further survey work.

* * *

A party of officials of The Texas Company visited Tulsa this week while making a regular inspection trip of the company's properties in Oklahoma and Kansas. The party was traveling by airplane and included, R. C. Holmes, president; E. G. Shreck, secretary to Mr. Holmes; J. N. Hill, Henry G. Lapham, Albert Rockwell, Eugene M. Stevens, and W. G. Mitchell, directors; G. B. Ames, T. Rieber, and W. S. S. Rodgers, vice presidents, and R. Ogarrio, assistant to the president.

* * *

A. Clark Bedford and F. H. Bedford, Jr., of the Standard Oil Company of New Jersey; R. M. Young, president of the Carter Oil Company; C. D. Watson, chief engineer of the Carter, and George H. Lang, head of the scouting department of the Carter; with E. H. Leroux, president of the Oklahoma Pipe Line Company, on a recent inspection trip through the Seminole fields in Oklahoma had quite an experience when their automobile became stuck in the mud. They looked anything but like the story book idea of officials of big companies after they had plowed around in the mud before they succeeded in pushing the car onto solid foundation.

OKLAHOMA PRODUCTION REPORTS FOR THIRD QUARTER THIS YEAR

Reports of crude oil and natural gas production in Oklahoma during the third quarter of 1928 as filed with the state auditor for taxation purposes, are given below. The reports published herewith are those where the production during the three months was valued at $5,000 and upwards and where the royalty interest (designated by asterisk) totaled a value of $2,000 or more for the three months.

Name and address—	No. of bbls.	M. ft. gas	Amount
A			
Arkansas Fuel Oil Co., Shreveport, La.	8,093.79	.....	$8,612.82
Accumulative Royalties Corp., Tulsa	13,819.77	.....	18,531.61
*Amerada Refining Corp., Tulsa	.....	.....	1,242.21
*Amerada Refining Corp., Tulsa	.....	.....	5,874.75
Amerada Refining Corp., Tulsa	890,347.17	1,378	1,360,618.80
*Amerada Refining Corp., Tulsa	3,936.33	.....	5,896.11
*Adams Royalty Co., Chicago, Ill.	67,613.42	.....	105,312.56
*Adams Royalty Co., Chicago, Ill.	.....	.....	5,234.46
*Atlantic Oil Producing Co., Dallas, Tex.	11,265.92	7,174	18,294.38
Atlantic Oil Producing Co., Dallas, Tex.	.....	573	41,729.51
Atlantic Oil Producing Co., Dallas, Tex.	504,218.84	.....	717,590.69
American Oil Development Co., Pittsburgh, Pa.	5,583.52	.....	7,653.23
American Royalty Petroleum Co., Tulsa	3,405.52	.....	5,207.01
*Altcm, B. N., Tonkawa	.....	.....	11,600.94
American First Trust Co., trustee for Wood, Gilbert & Wood, Oklahoma City	.....	.....	25,276.43
Amoroso, Louis and Carmela, Little Falls, N. Y.	200,309.34	.....	280,712.07
Alma Petroleum Co., Oklahoma City	1,933.50	60,279	6,456.94
*Abraham, Joe, Bristow	.....	.....	5,727.25
*Alma Royalties Corp., New York, N. Y.	.....	.....	16,002.43
Amster, N. L., Ardmore	6,582.64	.....	8,568.03
*Andrews, H. N. and Ethel B., New York, N. Y.	.....	.....	3,469.37
*Arnold, H. Y., Tulsa	.....	.....	2,992.71
*Andrews, Walter, Weslaco, Tex.	.....	.....	2,471.72
Argo Oil Co., Denver, Colo.	26,578.37	413,965	72,974.85
Arthur Oil Co., Sistersville, W. Va.	9,128.27	19,498	13,377.78
Adams & Prince, Amarillo, Tex.	6,492.43	.....	4,998.14
*Anthis, James M., Muskogee	.....	.....	2,297.76
*American Oil Royalty Seminole Corp., Tulsa	.....	.....	2,525.45
*Apple, S. A., Oklahoma City	.....	.....	19,891.89
B			
Bay State Oil & Gas Co., Kansas City, Mo.	10,605.29	.....	15,557.40
*Bay State Oil & Gas Co., Kansas City, Mo.	1,950.55	.....	2,789.64
*Bay State Oil & Gas Co., Kansas City, Mo.	2,119.99	.....	2,870.91
Barnara Oil Co., Oklahoma City	9,769.56	20,976	13,114.48
*Belco Royalties Co., New York, N. Y.	.....	.....	37,847.84
Barnsdall Oil Co., Tulsa	.....	1,145,140	75,962.99
Barnsdall Oil Co., Tulsa	1,397,694.78	.....	1,960,941.26
*Barnsdall Oil Co., Tulsa	1,921.28	.....	2,348.94
*Brittain, W. L., Oklahoma City	.....	.....	3,052.09
Breene, Mabel V., Tulsa	5,596.70	.....	7,214.53
Breene, Frank M., trust estate, Tulsa	6,479.24	.....	8,337.14
Breene, Frank M., trust estate, Tulsa	6,938.91	.....	8,657.29
Blackwell Oil & Gas, Cushing	.....	.....	361,510.62
*Billings, E. M., et al, Enid	.....	.....	2,030.55
*Belveal, F. M., Enid	.....	.....	4,237.97
*Broyles, W. O., Stillwater	.....	.....	2,465.45
*Buckner, Roy, Wewoka	.....	.....	3,138.88
*Bole, George S., Tulsa	1,970.46	2,951	3,075.77
Bole, George S., Tulsa	11,945.98	20,952	17,737.03
*Black, Sivalls & Bryson, Inc., Bartlesville	3,554.59	.....	5,080.73
Black, Sivalls & Bryson, Inc., Bartlesville	3,236.41	.....	4,496.42
*Brazell, James, Oklahoma City	.....	.....	3,287.08
*Blank, E. J., Cushing	.....	.....	7,310.85
Bridwell Oil Co., Wichita Falls, Tex.	18,766.85	.....	23,370.83
*Bechtel, E. R., Blackwell	1,960.23	5,196	3,042.85
Baggaley Oil & Gas Co., New York, N. Y.	5,315.94	.....	7,821.14
*Beverlin, F. A., Wichita, Kans.	.....	.....	15,679.66
Berry Petroleum Co., Tulsa	14,394.02	6,695	19,713.53
*Bryan, J. L., Chickasha	.....	.....	2,193.44
Bryan & Emery, Inc., Tulsa	17,727.05	4,995	28,102.97
*Berryhill, Earl, Sapulpa	.....	.....	3,785.13
*Barnum, Hubert, Natchez, Miss.	.....	.....	3,363.37
*Birdcreek, Timmie, Weleetka	.....	.....	2,318.21
Bisett, Lytle & Gray, Tulsa	9,208.44	.....	11,481.08
*Bolene Refining Co., Enid	.....	.....	16,630.51
*Bolene, V. E., Enid	.....	.....	2,090.27
*Boepple, Ben and Emma, Enid	.....	.....	2,108.87
*Barker, W. I., Ada	.....	.....	4,384.49
*Barker, G. H. and Anna, Shawnee	.....	.....	6,173.84
*Banta, D. D., Tecumseh	.....	.....	5,632.63
*Banta, D. D., Tecumseh	.....	.....	8,392.11
Braden & Moore, Tulsa	6,280.33	.....	8,468.43
*Bird, J. W., and Wm. Hanley, Bradford, Pa.	5,602.40	.....	7,165.88
*Bombarger, C. C., Paden	2,422.84	.....	3,278.04
*Brame, J. W., Los Angeles, Calif.	.....	.....	2,717.41
Brann, James, Bartlesville	.....	.....	5,928.24
*Bermont Oil Co., Bristow	5,875.86	2,774	9,037.92
*Bristow, Helen, Comanche	2,097.16	.....	2,985.39
Baker and Strawn, Tulsa	8,005.55	.....	10,276.82
*Baker, Frank A., Tulsa	.....	.....	2,439.13
Buttram, Frank, Oklahoma City	3,849.19	.....	5,651.56
*Buttram, Frank, Oklahoma City	.....	.....	19,040.61
*Barrett, Mrs. Mary F., Austin, Tex.	2,037.95	.....	2,696.07
Burlingame, C. E., Corp., Bartlesville	6,274.11	.....	9,032.72
*Bucholz, Augusta, Perry	.....	.....	2,091.21
Beacon Oil Co., Bartlesville	5,439.60	.....	6,375.32
Brown, A. C., Oil Enterprise, St. Louis, Mo.	4,641.87	.....	5,794.99
*Brown, I. C., Oklahoma City	1,742.41	.....	2,497.32
*Brown, J. J., Jr., Wichita, Kans.	.....	.....	3,485.35
*Brown, S. J., Duncan	.....	.....	2,768.70
*Bennett, John H., Ardmore	.....	.....	2,455.17
*Brame, I. L., Los Angeles, Calif.	.....	.....	13,624.47
*Brame, H. D., Jr., Los Angeles, Calif.	.....	.....	2,717.41
*Bart Royalty Co., Bartlesville	3,888.08	273	5,943.51
Bryant, H. E., and Jessie F. Bryant, Shawnee	.....	.....	3,079.20
*Berry, G. M., Pawnee	.....	.....	7,380.49
*Burk, George T., Shawnee	.....	.....	2,208.60
*Buck, Wm., Wetumka	.....	.....	4,220.67
*Bellis, J. H., Cushing	.....	.....	3,217.65
Boggs, Chas. W., Los Angeles, Calif.	.....	.....	6,517.31
Bridgman, F. R., Loudon, Ohio	3,264.54	.....	4,008.39
*Bond, I. T., Comanche	.....	.....	3,751.59
*Blasdell, Mary, Blackwell	.....	.....	3,445.46
Boring, E. M., Oklahoma City	20,761.48	.....	25,349.96
*Bumpass, J. M., Duncan	.....	.....	3,887.22
Bradley, E. A. and Anna, Tulsa	7,105.79	.....	8,904.88
*Burkhalter, L. J., Blackwell	.....	.....	3,472.04
Burke-Greis Oil Co., Tulsa	64,032.95	250,422	113,598.15
*Burke-Greis Oil Co., Tulsa	.....	.....	13,789.47
Burk, Hoffeld Oil Co., Tulsa	4,960.31	1,433	6,329.16
Burns, C. D., Preston	.....	.....	8,846.61
Bramon Oil Co., Inc., Tulsa	6,769.47	.....	8,904.80
*Biddle, G. A., Braman	.....	.....	2,197.45
*Brown, W. E., Co., Tulsa	5,286.46	.....	8,150.18
*Burks Lola May, Braman	.....	.....	2,197.45
*Beard, J. G., J. L. Crump and S. I. Kolb, Duncan	.....	.....	7,292.68
Beard, J. G., and S. I. Cobb, Duncan	11,317.38	.....	17,857.03
Beard & Crump, Duncan	10,752.02	.....	13,379.40
C			
*Carter, Joe, Wewoka	.....	.....	6,625.79
*Carter, Joe, Wewoka	.....	.....	10,805.11
Carter Oil Co., Tulsa	.....	Gas	418,190.00
Carter Oil Co., Tulsa	3,220,584.08	.....	4,474,850.26
Carter Oil Co. (suspense account)	.....	.....	224,840.05
Cities Service Gas Co., Bartlesville	.....	807,627	65,568.25
Camden, J. S., Inc., of Oklahoma, Fort Worth, Tex.	46,732.60	.....	78,645.11
Caddo Oil Co., Tulsa	34,783.82	.....	45,127.82
Champlin & Bass, Inc., Holdenville	3,881.38	.....	5,230.56
Continental Oil Co., Wichita Falls, Tex.	.....	.....	23,875.87
*Continental Oil Co., Tulsa	3,522.28	.....	5,139.40
Continental Oil & Refining Co., Independence, Kans.	4,791.39	.....	5,655.95
Continental Oil Co., Denver, Colo.	184,300.78	59,603	253,440.53
Consolidated Gas Utilities Co., Oklahoma City	1,813.78	201,338	14,390.30
Conservation Oil Co., Tulsa	9,877.36	.....	13,662.33
Coline Oil Co., Oklahoma City	60,234.59	.....	54,390.40

GILBERT & BARKER
Pipe Sealing Compound
FOR GASOLINE AND OIL PIPING
DIRECTIONS
Be sure threads are perfect and wiped clean. Apply compound to male threads only and make joint up tight. If compound becomes too thick it may be thinned by adding a little shellac. Use compound only for gasoline and oil piping, never on water steam or ammonia piping.
GILBERT & BARKER MFG. CO.
Springfield, Massachusetts, U.S.A.

See that pipe threads are thoroughly clean. Apply G & B Pipe Sealing Compound to male threads only. Then make joints up tight. Pipe joints properly made up in this manner will stay tight indefinitely.

Pipe Joints Stay Tight

... when made up with G&B Pipe Sealing Compound

This is the Compound that eliminates the leaks in those joints that are apt to leak in your gasoline and oil pipe line. Pipe joints made up with G & B Pipe Sealing Compound *stay* tight. They keep as firm and as *leak-proof as the pipe itself.* They cease to be a cause for worry. They no longer are the sieve-holes through which your money used to drip.

G & B Pipe Sealing Compound makes a double seal that will not dissolve in gasoline or oil. Be sure that it is used on all tank and pump installations—remember the joints now and you can forget them forever after.

The Compound comes in cans in three sizes: ⅛ pint at 15¢, pint at 75¢, and quart at $1.45.

GILBERT AND BARKER
MANUFACTURING COMPANY
PUMPS AND TANKS FOR THE OIL TRADE
SPRINGFIELD, MASS.

Visible Gasoline Pumps, mechanical measure or sight measure, hand or air operated, equipped with the famous NULTRA *bowls. Also piston type pumps with visible discharge. Pump and tank outfits for motor oils, including the popular* "NARRO-LUBE" *type. Special pipe sealing compound for gasoline and oil pump and tank installations.*

SAVES TIME

prevents kinking or dropping the rods

The Lorraine Sucker Rod Rack is the greatest time, rod and man saver ever developed for running in or pulling a string of rods. It suspends the rods vertically from the crown—no angle or bend. They are out of the way, protected against injury, yet always ready for instant use.

Built in two sizes, for 60 and 88 stands in perfect and compact position. Write for descriptive circular and prices.

LORRAINE
SUCKER ROD RACK

THE LORRAINE CORP.

Manufacturers and Distributors
OIL WELL SPECIALTIES
115th and Alameda Streets
Los Angeles, Calif.

Oklahoma Branch:
The Lorraine Corporation,
Percy D. Hammer, Agent
412 West First Street
Tulsa, Okla.

Northern Branch:
J. W. Monaghan,
P & R Building,
Casper, Wyoming

Name and address—	No. of bbls.	M. ft. gas	Amount
*Clubb, I. M., Kaw	8,579.99	.....	13,043.24
*Clubb, Laura C., Tulsa	.....	.....	13,023.72
*Crude Oil Royalties Corp., New York, N. Y.	.....	.....	13,755.33
Cotton Creek Oil Co., Wichita Falls, Tex.	6,614.31	.....	8,537.74
*Carmichael, Dorothy, Tonkawa	.....	.....	3,004.56
*Chisum, W. C., Oklahoma City	2,356.55	.....	3,484.91
Crockett-Hayes, Mrs. Elizabeth R., Oklahoma City.	3,810.62	.....	5,280.49
Crump and Beard, Duncan	10,752.02	.....	13,379.40
*Cruce, M. K., Oklahoma City	.....	.....	4,947.94
Cumberland Petroleum Co., Cleveland, Ohio	8,103.34	.....	8,653.29
*Campbell, J. D., Seminole	.....	.....	30,371.66
Caudill, Samuel J., Tulsa	1,787.14	.....	2,796.11
*Cook, Annie S., Muskogee	.....	.....	5,621.64
*Cline, W. S., trustee, Newkirk	.....	.....	2,061.94
*Cline, W. S., Newkirk	.....	.....	2,061.94
Canary, S. C., Tulsa	6,341.76	.....	7,776.86
*Clark, Lulu C., Seminole	.....	.....	6,748.38
*Cox, Edwin B., and Jake L. Hamon, Ardmore	.....	.....	41,712.31
*Cowden, R. A., Shawnee	.....	.....	6,408.87
*Central National Bank, trustee, Okmulgee	.....	.....	11,869.96
*Cox, Anna Elizabeth, Ardmore	.....	.....	3,338.97
Cushing Refining & Gasoline Co., Cushing	.....	.....	10,450.92
*Cal-Cul Oil Co., Okmulgee	.....	.....	1,941.34
*Caves, Noah J., Stroud	.....	.....	2,845.59
*Chilcoot, L. P., Wewoka	.....	.....	2,072.57
*Chilcoot, C. P., Wewoka	.....	.....	3,108.86
*Cecil, W. H., Tecumseh	.....	.....	5,993.12
*Chambers, O. L., Tonkawa	.....	.....	2,832.21
*Clark, Dillard H., Jr., Ponca City	.....	.....	5,322.02
Crosbie-Sturm and Davis, Tulsa	7,011.85	.....	7,237.10
Connelly, G. W., Caney	.....	.....	8,029.45
Cedar Gas Co., Bartlesville	.....	.....	6,015.87
*Craig & Andrews, receivers, Chandler	.....	.....	2,368.98
Clark, H. E., Tulsa	5,180.96	.....	7,464.14
Clark, H. E., Tulsa	.....	.....	16,496.51
Creo Oil Co., Tulsa	5,728.85	.....	6,644.62
*Cruce, W. I., et al, Ardmore	3,826.72	.....	4,791.26
*Cruce, V. L. and Ruth W., Tucson, Ariz.	.....	.....	4,694.06
*Central Commercial Oil Co., Tulsa	.....	.....	9,034.62
Champlin Refining Co., Enid	202,524.72	367	367,488.79
Critchlow, W. S., Ardmore	9,700.19	.....	14,363.33
*Camdel, Robt. C., Shawnee	.....	.....	6,517.24
Commonwealth Trust Co., Pittsburgh, Pa.	4,332.77	.....	5,270.72
Cotton Belt Petroleum Co., Tulsa	46,589.14	91,916	60,481.85
Clark and Dowden, Duncan	.....	.....	25,192.53
*Cralle, E. L., and C. L. Henley, Oklahoma City	.....	.....	2,352.14
*Cochran, A. D., Okmulgee	1,341.38	.....	2,234.24
*Colonial Royalties Co., Tulsa	.....	.....	7,037.12
Cudahy Oil Co., Cleveland, Ohio	12,884.85	.....	14,707.38
Cortez Oil Co., Tulsa	.....	.....	3,246.66
*Cortez Oil Co., Tulsa	1,916.76	.....	2,613.59
*Chowning, V. K., Okemah	.....	.....	3,995.97
Cherokee, Warren Oil & Gas Co., paid by Tidal Oil Co., Tulsa	7,202.35	.....	8,425.23
Comar Oil Co., St. Louis, Mo.	774,067.15	.....	1,226,127.61
Comar Oil Co., St. Louis, Mo.	.....	778,155	64,968.64
Crews estate, Oil and Gas Production, Enid	8,525.67	11,663,075	17,238.42
*Crews, L. E., heirs, Enid	1,217.96	.....	2,206.20
*Central Oil Royalties, Inc., New York, N. Y.	.....	.....	14,948.51
*Consolidated Pipe Line Co., Sand Springs	.....	.....	10,911.47
D			
Davis, Joseph, Tulsa	4,509.76	.....	7,223.64
Darby Lynde Co., Tulsa	26,443.06	16,713	42,769.60
*Darby Lynde Co., Tulsa	1,138.20	29,811	1,892.29
Devonian Oil Co., Tulsa	52,900.18	.....	79,989.58
Delaware Consolidated Oil Co., Tulsa	41,514.71	.....	48,312.90
*Dover Investment Co., Bartlesville	1,971.10	.....	2,621.72
*Danner, Caroline Burford, Indianapolis, Ind.	.....	.....	2,342.90
*Danner, H. R., Indianapolis, Ind.	.....	.....	2,343.91
*Delk Investment Co., St. Louis, Mo.	.....	.....	4,250.83
*Douglas, H. T., Shawnee	.....	.....	5,085.35
Don Oil Co., Blackwell	.....	.....	9,026.03
*Dowell, J. F. and Mary, Stroud	.....	.....	2,260.91
*Dickason, Elmer, Dilworth	.....	.....	2,436.99
*Douglass, O. H., Okmulgee	.....	.....	8,758.77
*Dixon, W. L., Duncan	1,985.46	.....	2,433.85
*Dilley, W. Y., trustee, Waurika	4,947.80	.....	4,036.24
Duncan-Wichita Falls Pipe Line Co., Wichita Falls, Tex.	6,032.68	.....	8,358.83
Dixie Oil Co., Inc., Shreveport, La.	108,050.07	339,113	171,767.87
Deaner, J. J., Okmulgee	8,381.41	.....	12,008.97
*Deaner, J. J., Okmulgee	1,946.17	.....	3,077.35
Darby Petroleum Co., Tulsa	163,066.73	1,120	296,463.85
*Durby, Anna Maud, Brighton, Colo.	.....	.....	2,339.53
*Diveley, Clarissa, Covington	.....	.....	2,116.01
*Desmond, W. H., Seminole	.....	.....	7,756.52
*Davis, Euler, Clearview	.....	.....	6,261.58
*Duke, W. R., Wichita Falls, Tex.	.....	.....	3,663.71
*Dillard, Mrs. V. E., Ardmore	.....	.....	4,331.51
*Davis, B. F., Wewoka	.....	.....	13,872.32
Dallas, Co., The, Tulsa	.....	.....	5,185.01
*Douglas, M. S., Weleetka	.....	.....	4,184.45
Duff, D. B., Cleveland, Ohio	.....	.....	6,936.76
*Doneghy, J. C., Tulsa	.....	.....	16,868.63
*Denney, C. E., Alma	3,154.85	.....	2,851.17
*Doss Oil Royalty Co., Oklahoma City	15,886.48	.....	20,895.90
*Darby, J. F., Muskogee	.....	.....	2,558.58
Doleman, Jessie, P., Ardmore	2,284.77	.....	2,515.59
*Darks, H. H., Oklahoma City	.....	.....	2,139.49
*Day, Annie, Earlsboro	5,553.07	.....	7,948.19
*Day, J. F., Earlsboro	2,776.50	.....	3,974.19
Denver Prod. & Ref. Co., Okmulgee	24,117.82	.....	33,910.73
*Denver Prod. & Ref. Co., Okmulgee	.....	.....	55,288.52
Davis, E. D., Oil Co., Oklahoma City	.....	.....	7,989.76
*Dillard, J. H. estate, Ardmore	.....	.....	4,054.69
Delmar Oil Co., Bartlesville	19,689.39	26,589	30,730.36
Deep Rock Oil & Ref. Co., Tulsa	37,774.48	209,824CH	58,869.48
Donell, Gordon, Paden	.....	.....	5,732.53
E			
Edgewood Oil Co., Tulsa	5,959.64	.....	8,342.92
*Eastern Royalty Corp., New York, N. Y.	.....	.....	10,829.69
*Edwards, R. J., Oklahoma City	.....	.....	3,884.57
Eagle Gasoline Co., Tulsa	.....	.....	6,369.40
Eagle Picher Lead Co., Henryetta	2,767.73	83,169	9,480.95
Emery, Lewis, Jr., & Sons, Bradford, Pa.	.....	.....	6,984.37
*Eason, T. T., Enid	2,047.04	.....	3,167.77
Eason, T. T., Enid	6,200.19	.....	8,574.40
*Equitable Royalty Corp., Shawnee	.....	.....	29,296.17
Elm Oil Co., Tulsa	8,773.24	14,017	11,606.52
*Elm Oil Co., Tulsa	2,507.90	3,980	3,505.60
Ellis Drilling Co., Wichita Falls, Tex.	6,458.93	.....	8,640.84
*Elswick, P. C., Lamont	.....	.....	5,831.65
Empire Oil & Ref. Co., Bartlesville	219,908.50	.....	308,881.91
Empire Oil & Ref. Co., Bartlesville	.....	260,042CH	18,786.17
*Empire Oil & Ref. Co., Bartlesville	17,475.88	.....	24,413.65
Empire Oil & Ref. Co., Bartlesville (suspense)	.....	.....	36,163.35
*Elaine Oil Co., Tulsa	2,657.48	.....	4,019.35
Elliott & Smith, Tulsa	7,440.98	.....	10,193.31
Elliott & Vensel, Tulsa	.....	.....	7,059.66
F			
*Freelove, Mrs. Etta, Chicago, Ill.	.....	.....	20,570.39
*Freelove, L. W., Chicago, Ill.	.....	.....	8,227.56
*Freelove, Bessie, estate, Chicago, Ill.	.....	.....	5,849.94
*Franklin, Wirt, Ardmore	12,196.14	.....	14,577.25
Franchot, D. W., & Co., Tulsa	35,719.88	64,645	51,956.40
*Franklin, Wirt, Petroleum Corp., Oklahoma City	3,621.76	.....	4,402.66
Franklin, Wirt, and Mary C. Cates, Oklahoma City	2,457.79	468	2,940.64
Franklin, Wirt, Petroleum Corp., Ardmore	219,303.64	.....	254,726.70
Finance Oil Co., Towanda, N. Y.	14,622.59	.....	19,047.95
*Falkenburg, C. W., Wewoka	2,563.93	.....	3,991.19
*Freed, Jos. D. R., New York, N. Y.	.....	.....	2,870.25
*Fyke, Laura B., Shawnee	.....	.....	8,297.64
*Foster, James F., Anthony, N. Mex.	.....	.....	2,386.45
Foster Oil Co., Tulsa	7,325.89	.....	11,664.38
*Foster Petroleum Corp., Tulsa	3,154.24	.....	4,631.80
Fuhrman Petroleum Co., Okmulgee	.....	.....	10,586.67
Foster Petroleum Corp., Bartlesville	142,247.65	.....	190,864.57
Foster & Davis, Inc., Bartlesville	8,564.78	.....	11,206.75
Future Development Co., Tulsa	.....	.....	7,804.65
*Fitzgerald, D. C., Ardmore	1,700.11	.....	2,395.49
Fitzgerald, D. C., trustee, Ardmore	6,072.43	.....	7,618.53
*Fitzgerald, Lena, Blackwell	.....	.....	18,023.50

Parkersburg

HAS SERVED THE OIL FIELDS OF THE WORLD FOR THIRTY-ONE YEARS

Quality & Service

MEN — Money — Machinery. These are, basically, the resources that Parkersburg, through its organization, its manufacturing facilities and its field service, places at the disposal of users of drilling equipment and tankage.

From the pouring of molten metal, the forging of steel, the operating of steam hammers and forming machines, on up through the manufacture of the finished product, ***Quality*** is built into every item of Parkersburg Drilling Equipment and Tankage.

As Parkersburg rigid standards of ***Quality*** are strictly adhered to, so is Parkersburg ***Service*** continuously maintained at a high point of efficiency.

For thirty-one years Parkersburg has served the oil fields of the world, and ***Today,*** as it was ***Yesterday,*** and as it will be ***Tomorrow,*** Parkersburg ***Quality*** and ***Service*** are known and recognized the world over as the standard for comparison.

Parkersburg Products

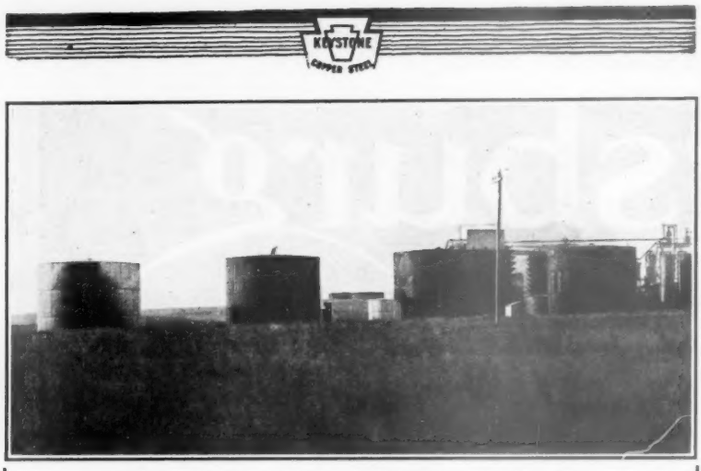
- Steel Derricks & Steel Crown Blocks
- Chain Driven Sand Reels & Bailing Reels
- Steel Wheels
- All-Steel Standard Rigs
- Rig Irons (A.P.I. Standard)
- Portable Drilling Machines (Wood & All-Steel)
- Bolted Steel Tanks
- Miscellaneous Drilling Equipment

Check the equipment in which you are interested, tear out and return this page, with your name and address, to us, and we will send you complete information on the items checked.

The
PARKERSBURG RIG & REEL COMPANY

Executive Offices & Main Plant, Parkersburg, W. Va., U. S. A.

Sales Offices, Warehouses and Stocks Carried at Important Producing Fields



Four 3,000-Bbl. Maloneys, MacMillan Refining Co., Borger, Texas, erected December, 1926.

MALONEYS Protect the *Price* of Stored Oil—

MALONEY Bolted Steel Tanks safeguard the price of petroleum products by affording unusual protection against loss in gravity due to evaporation. These tanks are rendered vapor-tight to an exceptional degree by three exclusive MALONEY features. (1) Our patented "crimp" at seams and joints obtains close fit of parts. (2) Our superior pliable rubber gasketing packs bolt holes tightly. (3) Our Gaso cement insures seams that are oil, water and gas tight.

MALONEYS are made of rust-resisting Keystone Copper Steel, with special bolts of 90,000 pounds tensile strength and painted with Maloney special pearl gray paint. Seams are reinforced with rigid steel channels. Large cleaning out plates are set flush with bottoms. Valve and thief hatch equipment is the best obtainable.

"Alone in Quality"

MALONEY TANK MFG. COMPANY

Tulsa, Okla., U. S. A.

Distributors at All Principal Petroleum Points

Sizes: 12 to 10,000 Barrels

Packed in Steel-Bound Crates for Export

Howell Aluminum "4-in-1" Vacuum Pressure Valve and Thief-Hatch—The BEST and LATEST Deck Equipment—POSITIVE Safety.

MADE OF KEYSTONE COPPER STEEL

MALONEY PATENTED BOLTED COPPER-STEEL TANKS

MADE OF KEYSTONE COPPER STEEL

MALONEY
ALONE!

Name and address—	No. of bbls.	M. ft. gas	Amount
*Van Buskirk, Mrs. Fronia, Los Angeles, Calif.	.....	.....	2,717.41
*Frasier, G. W., Kingfisher	.....	.....	19,469.58
*Fugate, Eliza, Oologah	.....	.....	2,231.37
Fort Ring Oil & Gas Co., Fort Worth, Tex.	5,768.35	2,634	7,694.35
*Feagin, N. B., Walter H. Gant & Knox L. Garvin, Ardmore	.....	.....	5,107.46
*First National Bank, Chickasha	2,369.15	.....	3,046.52
*Fondren, W. W., Houston, Tex.	2,037.90	.....	2,696.09
*Farmers State Bank, trustee for Kisner Royalty Co., Garber	.....	.....	3,119.91
*Fried, Samuel, Sulphur	.....	.....	43,733.74
*Fleet, John J. and Alice, gdn., Ada	1,710.68	.....	2,019.29
*Fleet, D. F., Ada	.....	.....	33,978.09
*Fleet, Alice, gdn., Ada	.....	.....	4,821.47
*Fennell, J. T., Pauls Valley	.....	.....	3,289.72
*Fore, J. C., Wewoka	.....	.....	4,802.74
*Franks, W. H., Seminole	.....	.....	19,309.36
*Franks, Rosa J., Seminole	.....	.....	9,836.68
Flynn Oil Co., Oklahoma City	17,972.71	.....	21,417.92
*Fourth National Bank, trustee, Wichita, Kans.	.....	.....	3,814.03
*Frederick, Fred, Los Angeles, Calif.	.....	.....	2,078.79
*Folk, H. B., Sand Springs	3,018.81	.....	4,612.13
*Fox Royalty Co., Tulsa	4,572.16	.....	4,644.85
Fox Royalty Co., Tulsa	7,908.32	.....	8,141.94
G			
*Grisso, W. D., Seminole	.....	.....	14,637.98
*Grisso, W. E., Seminole	.....	.....	56,786.29
Gled Oil Co., Tulsa	18,594.31	.....	28,901.71
Glidden Oil Corp., Tulsa	8,673.65	8,085	12,430.03
Gilcrease Oil Co., Tulsa	.....	.....	83,464.65
Grieves, John B., Terlton	8,663.72	.....	12,066.81
Gorton Trust, Cement	9,758.61	.....	12,471.80
Galvez Oil Corp., Tulsa	4,764.72	.....	8,948.99
Gilmer Oil Co., Ardmore	61,118.65	22,889	61,783.42
Guaranty Trust Co., of New York, New York, N. Y.	.....	.....	22,598.26
Goldelline Oil Corp., Oklahoma City	11,227.53	.....	14,795.72
Gates Oil Co., Ardmore	10,035.87	.....	11,252.44
Gardner Petroleum Co., Tulsa	.....	.....	36,762.46
*Gardner, James H., Tulsa	.....	.....	2,462.27
Gayer, W. E., Tulsa	.....	.....	13,252.66
Gregg, C. O., Ardmore	5,502.18	.....	7,043.06
Glass & Harmon, Nowata	10,269.47	.....	13,580.21
*Glass, J. Wood, Nowata	4,651.74	.....	5,853.37
*Van Graafeiland, C. P., St. Louis, Mo.	.....	.....	10,274.56
*Goforth, Mary B., Shawnee	.....	.....	9,171.70
*Greer, F. H., Tulsa	.....	.....	3,545.37
*Green, J. D., trustee, Maud	.....	.....	2,315.06
Gragg, C. E., Paden	.....	.....	13,078.19
*Gragg, C. E., Paden	.....	.....	2,925.21
*Glenny, Ethel, Blackwell	.....	.....	3,445.46
*Green, Myrtle, Oklahoma City	4,382.11	65,601	5,733.41
*Green, J. D., Maud	.....	.....	2,668.87
*Graham, W. A., estate, Clarion, Pa.	.....	.....	3,681.85

(Continued on Page 150)

CENTRAL WEST

(Continued from Page 72)

& Gas Co.'s No. 3 on the W. P. Powers, Section 24, Pike Township, showed an initial production the first 24 hours of 60 bbls. from sand at from 3,024-70 feet. Same company is starting No. 3 on the Isaac Norris farm, Section 12. In Clark Township, the Ohio Oil Co. is drilling a test on the Robert Rhode farm, Section 7. The Pure Oil Co. is drilling No. 1 on the H. H. Mohler, and the Logan Gas Co. is drilling No. 1-3,044 on the Frank Mullet, same township.

Summitt County

In Summitt County, the East Ohio Gas Co. brought in an exceptionally good gas well in a test on the Lloyd Bliler, Section 27, Franklin Township, and drilled a dry hole in a second test on the Charles Bougher, Section 33. F. A. Brendall and others found a gas well above the average in a test on the D. E. Spangler, Section 34, same township, and made locations for a test on the E. A. Raber and C. L. Wilcox farms, in Section 26, which is No. 2 and also for No. 1 on the Levi Stump farm, Section 22, all in the same township. East Ohio Gas Co. is drilling No. 1 on the Luna Lake Club's property, Section 33, same township. In Green Township, F. A. Brendall and others' test on the John Wenhart, Section 20, is an average gas well in the Newburg sand. In Spring Township,, Zindel and others are drilling a test on the Chenoweth farm, Section 5.

In Licking County, Perry Township, H. C. Farmer's test on the John Glaggett farm, Section 4, is a 3-bbl. pumper, from sand at from 801-10 feet. Whitehill Gas Co. is drilling No. 3 Albert Ashcraft farm, Section 2, and Settles Oil Co. is drilling No. 4 Jacob Lothers farm, Section 8. In Fallsburg Township, the Preston Oil Co. is drilling No. 1 Waylen Ashcraft farm, Section 11, and made locations for Nos. 2 and 3 same farm. In Hopewell Township, the Hope Construction & Refining Co. is drilling a test on the S. L. Burrier farm, Section 1. In Franklin Township, Ralph Brothers, Inc.'s No. 13 on the Boy Scouts property, Section 18, produced 3 bbls. at from 707-14 feet, while No. 14 is also a 3-bbl. producer from 705-12 feet.

In Muskingum County, Perry Township, the Mid-East Oil Co.'s test on the William Knight, Section 15, got a showing of oil in the Clinton, which was topped at 4,003 feet and went to 4,030 feet. What the showing will do remains to be seen by further testing of the well. In Hopewell Township, the Hope Construction & Refining Co. is drilling a test on the Reason Bolin farm, Section 11.

Athens County

In Athens County, Ames Township, F. J. Beasley has a small gas well at a test on his farm, Section 3. The gas was found in the second Berea sand at from 1,322-45 feet and drilled to a total depth of 1,349 feet. Ohio Fuel Gas Co. is drilling No. 2-3,288 on the William R. Phillips, Section 8. Orondorff and others are drilling No. 1 Myrta Green, Section 2, and made a location for a test on the Vesta Thompson farm, Section 3. In Carthage Township, the Logan Gas Co. made a location for No. 2-3,053 on the C. C. Snodgrass, Section 31 also for No. 2-3,054 on the Mary Barnhart, Section 32. In Berne Township, the Bailey Oil & Gas Co. is drilling No. 3 Fannie E. Wells, Section 35, and Charles Fox is drilling a test on the W. R. Goddard, in fractional section 24. In Lodi Township, the Ohio Fuel Gas Co.'s No. 1-3,314 on the L. M. Niggemeyer in fractional Section 4, is a light gasser, in the second Berea sand at from 1,660-74 feet and went to total depth of 1,685 feet. Farmers Oil & Gas Co. got a dry hole in a second test on the R. E. Wilson, Section 34, at a depth of 579 feet.

In Meigs County, Sutton Township, the Wehrle Oil & Gas Co.'s No. 1 David B. Cross farm, Section 17, is reported at 2 bbls. from the first Berea sand at from 1,863½-83½ feet. Bowman Run Oil & Gas Co. is drilling a test on the Lucius Holter, Section 12. The Pure Oil Co. is drilling tests on the Hanson and Holton farms.

Jackson County failed to report any completions. In Franklin Township, the Ohio Fuel Gas Co. made locations for No. 1-3,362 on the Henry Lefler, Section 13; No. 1-3,361 on the W. F. Black, Section 22, and No. 1-3,360 on the M. C. Eubanks, Section 23. Same company made a location for No. 1-3,363 on the L. T. Rice farm, Section 13, Lick Township.

In Fairfield County, Rush Creek Township, Shenker and Whitehill's No. 4 on the Jesse Grove, Section 26, produced 5 bbls. initial at from 2,665-90 feet. City Natural Gas Works, made a location for No. 3 on the Henry Hartman, Section 23, Pleasant Township, same county.

Guernsey County

No completions were reported from Guernsey County. In Cambridge Town-

IT HAS BEEN SAID:

EXPERTO CREDE*

"Finders Keepers"

The "Finder" of a good burner picked from the many so-called gas burners on the market today is exceedingly lucky.

Why trust to "luck" when a thorough investigation of the METTLER ENTRAINED COMBUSTION GAS BURNER will unquestionably prove to you that it is the most efficient, durable and all-around satisfactory burner to be found?

METTLER GAS BURNERS are now used in boilers and stills, developing over 600,000 Horse Power and saving thousands of dollars in fuel and upkeep costs.

METTLER BURNERS HAVE NEVER BEEN SUCCESSFULLY IMITATED

We Solicit an Opportunity to Serve.

*Trust One Who Has Had Experience.

LEE B. METTLER CO.
406 So. Main St.
Los Angeles, Cal.

Please quote Prices on the equipment for the following:

No. of Boilers.....
H. P...... **Make**.....
No. of Stills.....
Size..... **Type**.....
Name.....
Company.....
City..... ***State***.....

Better

"BIG BOY"
MODEL 130R

Built for big deep holes and heaviest tools. With a powerful six cylinder motor of proven dependability, 6" bore and 7¼" stroke. Equipped with all the latest accessories—dual ignition, electric starter, governor, pressure oiling system, oil filter, sectional-type radiator, and air cleaner. Motor entirely enclosed in hood, can be locked when not in use, also serving as a protection against weather. A mighty motor for heavy duty.

Bulletin 11J.

-:-

"YOUNGSON"
MODEL 81X

Here you have an ideal engine for that lighter drilling. Practical for deepening oil or gas wells and cleaning out work. A six cylinder Hercules motor. B.H.P. 80 H.P., 1,600 R. P.M. Bore 4½". Stroke 4¾". Weight 4,500 pounds, easy to move and quickly set up.

Bulletin 10J.

TO BUY A YOUNG GAS DRILLING ENGINE THAN WISH YOU HAD!

ASK ANY USER

YOUNG ENGINES

YOUNG ENGINE CORPORATION
CANTON, OHIO

BRANCH OFFICE
2507 Commerce Street, Dallas, Texas

REPRESENTATIVES:
Federal Supply & Machine Co., Winfield, Kansas
Pearson's Machine Shop, Oil City, Pa.
Levi Duncan, Parkersburg, W. Va. J. F. George, Kane, Pa.

Parts stocked at Dallas—Sweetwater—Winfield—Oil City

YOUNG ENGINE CORPORATION,
2110 Allen Ave., Canton, Ohio.
Kindly send me your Bulletins Nos. 10J and 11J.
OG 11228
Name ----------
Firm ----------
Street ----------
City ---------- State ----------

the Dr. D. A. Craig, in Lot 13, is drilling, while Lee & Moseley are drilling a test on the I. A. Cable, same lot.

In Morgan County, Marion Township, the Ohio Fuel Gas Co.'s No. 3-3,234 on the C. D. Dougan, Section 24, is a light gas well from the second Berea sand at from 1,604-27 feet and sent to a total depth of 1,630 feet. Same company is drilling No. 4-3,247 on the Charles G. Hopkins, in fractional Section 23. Bauman and others, made a location for No. 8 on the Florence Shuster, Section 18. Burns Oil Co. set a stake for No. 13 on the Esther K. Woolman, Section 34. The Kemrow Co. made locations for No. 1 Ellsworth Mosier, Section 23, and No. 4 on the Charles Hoffman, Section 29. In Penn Township, Sutton Brothers have a fair gas well in No. 4 on the Ida Hotchkiss farm, Section 10, from the Salt sand at from 655-60 feet. Henning Brothers have an average gas well in No. 24 on the Ada Harper, Section 2, from the second Berea sand from 1,564-71 feet and drilled to a total depth of 1,584 feet. An average gas well is one below 500,000 feet. In Union Township, Van Fossen & Scott's No. 30 on the Charles Harrison farm, Section 11, pumped 2 bbls. from the First Cow Run sand at from 338-58 feet. Patterson Oil Co.'s No. 21 Emma Patterson, Section 12, produced 2 bbls. from the same sand at from 110-40 feet.

EASTERN FIELDS

(Continued from Page 68)

same luck at a test on the Mary Yost farm.

In McKim district, Pleasants County, Howard Hall and others have drilled a test on the L. C. Fleming farm through the Third Salt sand and dry. On Twelve Pole Creek, Harvey district, Mingo County, F. H. Yates has drilled a test on the Alta Phelps lease, on the Albert Maynard farm into the Maxon sand. It is a gasser good for 1,000,000 feet.

Drilling and Starting Tests

In Troy district, Gilmer County, F. G. Bish has started to drill a test on the G. S. Stalnaker farm. In the same district, A. L. Britton is hauling rig material to a location on the A. S. Jones farm. In Skin Creek district, Lewis County, W. H. Smith has started to drill on the William R. Jewell farm. In Freemans Creek district, the Moran Drilling Co. is drilling deeper its test on the Molly Griggs farm. In Mannington district, Marion County, the Clifton Oil Co. is hauling rig material to a location on the Simon Moore farm. In DeKalb district, Gilmer County, Alfred Ellis and others have started to drill on the M. E. Ellis farm. In Center district, Calhoun County, W. H. Bickel is due in the sand on the Amie V. Stalnaker farm. On Rock Camp Run, Spencer district, Roane County, Pell, Newman and Roberts have moved a drilling machine to location for their No. 42. On Cains Run, Murphy district, Ritchie County, the Hope Natural Gas Co. has completed the rig on the Lee Collins farm.

In Meade district, Tyler County, Otis Hadley and others are drilling a test on the John Loneberger farm. In McElry district, S. J. McIntyer is due in the Keener sand on the Benjamin McIntyre farm. In Liberty district, Marshall County, the Manufacturers Light & Heat Co. is drilling on the D. T. Murphy farm. In Otter district, Braxton County, the Philadelphia Oil Co. has made a location on the G. B. Howell farm. In Ripley district, Jackson County, H. F. Parsons Oil & Gas Co. is drilling on the Dr. V. L. Caston farm. In Washington district, Lincoln County, the Harvard Gas Co. is still fishing on the J. N. Moore farm. In Scott district, Boone County, Earl Cameron has spudded in on the L. R. Griffin farm.

Lincoln County

In Duval district, Lincoln County, the United Fuel Gas Co. has started to drill on the W. E. Hilbert & Co. farm. In Mannington district, Marion County, C. R. Morris is fishing at 3,000 feet on the Riley Arnett farm. In the same district, the Clifton Oil & Gas Co. is hauling rig material to a location on the Simon Moses farm. In the same district, the J. I. Moore Oil & Gas Co. is rigging up on the Robert Floyd farm. In Ten Mile district, Harrison County, Rhodes & Moses are building a rig on the John Shahan farm. In Grant district, Doddridge County, Trainer Brothers have shut down at 1,800 feet on the J. D. Crabtree farm. In Hackers Creek district, Lewis County, the McCall Drilling Co. has part of the rig material at a location on the L. I. Bargerhoff farm. In Clay district, Wetzel County, the Pittsburgh & West Virginia Gas Co. is drilling deeper on the J. B. Pettit farm.

Southwest Pennsylvania

In Springhill Township, Greene County, the Gray Oil & Gas Co. has drilled down to the Gordon sand a second test on the J. L. Caseman farm and showing a little oil and gas. In Perry Township, the Carnegie Natural Gas Co. has a gasser in the 30-foot sand at a second test on the H. Lemley farm.

KENTUCKY-TENNESSEE

(Continued from Page 68)

Ohio Oil Co.'s No. 4 on the Whittaker Heirs 84 acres, produced an initial of 15 bbls. at a total depth of 580 feet. A string of 560 feet of casing was set in this hole and sand found from 565 to 576 feet. Same company's No. 3 on the W. B. Kelley 105 acres, same pool, produced 10 bbls. from a total depth of 60[illegible] feet. Casing set in this well at 570 feet and sand at from 578 to 598 feet.

Lyle and French drilled a second test on the J. W. Whittaker 66 acres, in the Ambrose Pool which was a duster. Sand found from 650 to 660 feet and drilled to a total depth of 915 feet.

Ray Bigler and others' No. 5 on the Ed Handricks, in the Whittaker Pool set 735 feet of casing, found sand at from 752 to 762 feet and finished up at 76[illegible] feet, the well doing an initial of 30 bbls.

White Plains Oil & Gas Co.'s No. 1[illegible] on the J. J. Midkiff Pool, produced but 5 bbls. at a total depth of 763 feet; sand was found at from 737 to 753 feet and 735 feet of casing was set in the hole. Same company's No. 6 C. A. Kelley [illegible] acres, same pool, set a string of 43[illegible] feet of casing, sand at from 433 to 45[illegible] feet and went to a total depth of 46[illegible] feet, making 10 bbls.

In the Ralph Store Pool, C. Claypool and others' No. 7 on the J. L. and J. H. Ralph 125 acres, is an exceptionally good producer with an initial of 60 bbls. at a total depth of 475 feet. A string of 45[illegible] feet of casing was set and sand at from 455 to 473 feet.

In the Kelley Pool, S. H. Russell and others' No. 7 on the A. P. Kelley 34[illegible] acres, is a dry hole at a total depth of 465 feet. Same parties' No. 2, on the Brown Heirs 43 acres, pumped an initial of 20 bbls. from a total depth of 425 feet, sand being found from 400 to 414 feet and a string of 290 feet of casing was put in the hole.

In the Dundee Field, the Sunnyda[illegible] Oil & Gas Co.'s No. 2 on the J. F. Mitchell 100 acres, was dry at 410 feet and the Creek Drilling Co.'s No. 1 on the V. Wetserfield farm, was dry at 601 feet.

Barren County Wells

The old Glasgow Field of Barren County brings in a few small pumpers and a few dry holes once in a while. In the Gorby Pool, Shelley L. Large drilled a 10-bbl. pumper in No. 11 on the O. L. Gorby farm. Elliott and others' No. [illegible] Browning, is a 3-bbl. pumper. H. L. Ogle's No. 2 Watt Ellis farm, same pool, is a 3-bbl. pumper.

In the Lecta Pool, southeast of Glasgow, the Esslinger Oil Co.'s No. 16 on the Glass farm, is a 10-bbl. producer. George L. Potter's No. 3 Hickerson, is only a 1-bbl. pumper, while B. A. Stumbo and others' No. 8 Williamson, is a 3-bbl. pumper.

In the Emery Moore Pool, J. J. Sa[illegible]er's No. 5 Winn farm, is a 3-bbl. pumper. Holliday & Michlebuch's second test on the Burns, is a duster.

In the Coral Hill Field, Hunt & Lea[illegible] have a duster in a second attempt on the Smith lease, making the second failure

amson Oil Co.'s No. 16, Browning farm, the Lecta Pool, is good for 7 bbls. B. Tyler's No. 3 on the Guy Jackson rm, is dry.

Daviess County Wells

The Owensboro Field of Daviess Coun- failed to report anything but small oducers, outside the territory where good producers have been found.

The Brown Pool developed a duster hen P. A. Yager and others drilled in dry hole in No. 2 on the Delilah Jewell se. In the same pool, Young & John- n's No. 1 on the Barney Mackey farm, uth of the good wells on the Oscar Tells farm, getting only a 7-bbl. pro- cer, but a little in advance of produc- on.

The Kenrock Oil Co. found a duster 0 feet from the south line and 200 feet m the west line of the Charles Gil- re 54 acres, in the Roby Pool.

Leeper Oil Co.'s No. 3 in the SW cor. the C. D. Veach 209 acres, produced t 2 bbls. Ohio Oil Co.'s No. 1 1,000 et from the south line and 600 feet m the east line of the William Hol- nd, pumped 6 bbls.

Scattered Wells

Near Pellville in Hancock County, the i-County Oil & Gas Co.'s second test 00 feet from the south line and 600 et from the west line of the Lee Rosen- tt 60 acres, is among the week's dust- s. Sears and others are drilling a test the Edward Baize 98 acres, same ld.

In the Franklin Field of Simpson unty, V. H. Fry and others' No. 3, 0 feet from the north line and 300 feet m the west line of the James A. eet, pumped 2 bbls. from the shal- sand at 496 feet.

In the Bowling Green Field of War- n County, Allen & Parent's test, 600 t from the north and west lines of the G. Douglas farm, south of Bowling een, pumped 2 bbls. from 500 feet, and V. Hatcher and others' test, near the cor. M. V. Hatcher farm, in the same ea, pumped 1 bbl. at the same depth.

In the Scottsville Field, Settle dis- ct, Allen County, W. J. Stevens is illing a second test on the Thaxton illoughby farm. Rehr & Ogle are illing on the Grubbs farm, and the hite Plains Oil & Gas Co. is drilling 31 on the T. J. Oliver farm.

Field Pickups

The Cumberland Petroleum Co. is re- ted in the sand with No. 25 on the Hamilton farm, in the eastern por- n of the Ambrose Pool, in Ohio County making a good showing. This well is tenth drilled on the south 100 acres the 276-acre farm, the Cumberland mpany having purchased the south 100 res and 9 producing wells from Daley Lowman a short time ago, and there close to 30 more locations on the big ct of land.

James C. Ellis has his No. 37 in the d and showing as well as former mpletions on the J. R. Weller 110 es, in the Ambrose Pool, of Ohio Coun- His No. 7 on the B. L. Gossett rm, near the Hamilton lease, is also the sand.

The Swiss Oil Corp. of Lexington is ayed again at a depth of about 1,300 t at its test on the Shacklett lease, McLean County, having found another e in, making the second for this test.

The Wood Oil Co. has moved two s into the Red Hill area of Daviess unty. One is on the W. M. Tanner d the other on the R. T. Sands farms.

The H. C. Smith Drilling Co. has ved a rig on the Sanford Miller lease, r the Emmett Burton farm, on the rtford Road, 11 miles southeast of ensboro, in Daviess County.

The Wiser Oil Co. got a showing of in the Jett sand in a test on the Mose lls, at Fordsville, in Ohio County, decided to go deeper in a hunt for a re productive sand.

Paragon Runs

The Paragon Development Co.'s runs n the Barren County Field for Octo- totaled 21,182.76 bbls., and from Cumberland-Monroe-Clinton Coun- 2,188.82 bbls., for a total of 23,- 58 bbls. This company's runs from y County, Tennessee, for October were 9 bbls.

NEW PIPE LINE COMPANY FOR GAS IN MUSKEGON

(Continued from Page 80)

contracts with the operating companies provide for this amount.

The three wells from which gas will be obtained are the Paragon Oil Co.'s No. 1 Dornbush, NW SW Section 8-10-16, its No. 1 Tripp, SE SE Section 5-10-16, and A. S. Cochran's No. 1 Taggart, also SE SE Section 5-10-16.

The open-flow capacity of the Dornbush well as gauged is 16,000,000 feet. The Tripp well has an open-flow capacity of 15,000,000 feet, and the Taggart well came in with an open-flow capacity of about 10,000,000 feet.

In addition, the new pipe company has an agreement with the Paragon Oil Co. for as much of the output of its No. 1 Kooi well, SW NE Section 8-10-16, as may be needed. This well at present is a small pumper in the Traverse formation, but will be drilled deeper to the Dundee pay. As it is located in the heart of the field, it will be a certain large producer of gas in the lower formation.

Organizers of the Muskegon Pipe Line Co. also hold leases on 200 acres in the field on which they will drill a number of wells. Their potential supply of gas is considered to be adequate to supply the two large companies and other small ones in the same part of the city for a period of years.

R. L. Pattinson, J. V. Howard and R. H. Owen, all of whom are gas-line operators in Canada and Mississippi, are the organizers of the new company. They were among the first gas operators to become interested in the possibilities of the Muskegon Field and, in fact, had a company practically organized to operate under the name of the Central Pipe Line Co. several months ago when the West Michigan Consumers Co. was formed.

Messrs. Pattinson and Howard are associated with the Central Development Co., operators at Chatham, Ontario. They also are interested in the Amory Natural Gas Co. of Amory, Miss. Mr. Pattinson is one of the organizers of the first pipe line into Amarillo, Tex., and of the Union Natural Gas Co. in Canada.

No announcement of the price at which the company will deliver gas to the industries has been made, but it is understood the minimum price for 2,000,000 feet a day or more will be about 15 cents per 1,000 feet.

New and lower rates for industrial users of gas in Greater Muskegon to supersede the first tentative schedule of rates was filed this week with the Michigan Public Utilities Commission by the West Michigan Consumers Co.

The schedule filed October 19 provided for a minimum rate of 20 cents per 1,000 feet for the second 2,000,000 feet used monthly for boiler purposes. The maximum rate was 50 cents per 1,000 for the first 100,000 feet used for engine purposes. Service has been divided into three classes: Class 1, for engines; Class 2, for core ovens, heat treating, enameling ovens and dry-kiln operations; and Class 3, for boiler purposes. Under the new rates the maximum rate will be 45 cents for the first 100,000 feet used under Class 1. This class is graduated down to 26 cents per 1,000 feet for all over 800,000 used monthly.

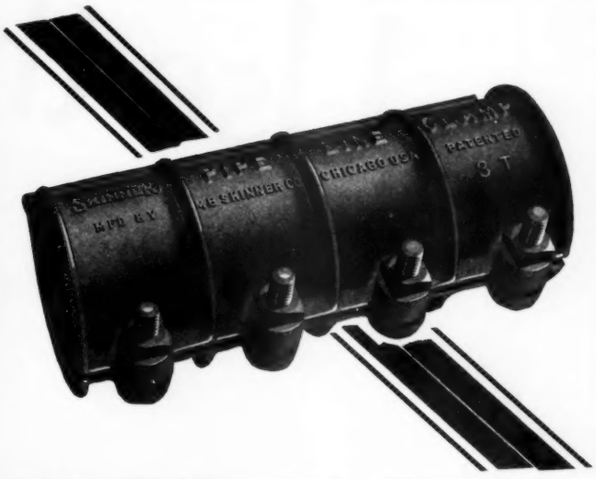
The maximum rate under Class 2 will be 40 cents per 1,000 feet for the first 100,000 feet used monthly. The minimum rate for this class will be 29 cents per 1,000 feet for all over 1,000,000 feet used monthly.

The maximum rate for boiler gas will be 25 cents per 1,000 feet for the first 500,000 feet used monthly. The minimum rate under the new schedule will be 18 cents per 1,000 feet for all over 4,000,000 feet used monthly.

Part of the company's main 12-inch line between the field and the Muskegon industries has been blown and tested.

SKINNER Pipe Line Clamp

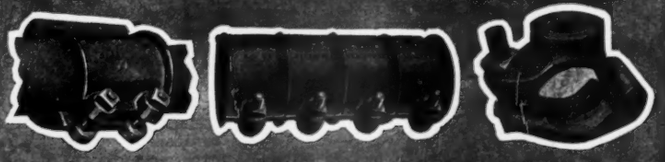
For Repairing Long Splits in Pipe



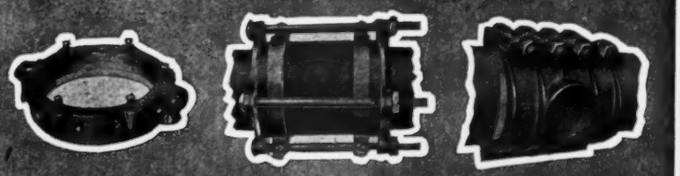
THIS STRONG, simple Clamp is designed particularly for high pressure on splits and lines that are corroded for six or eight inches.

Made with the Skinner principle of bolts on one side only—a hinge on the other. The nuts are always on top. Made for standard sizes of two, three and four inch pipe.

The Skinner Pipe Line Clamp is particularly valuable during the freeze-ups of the "Norther" season.



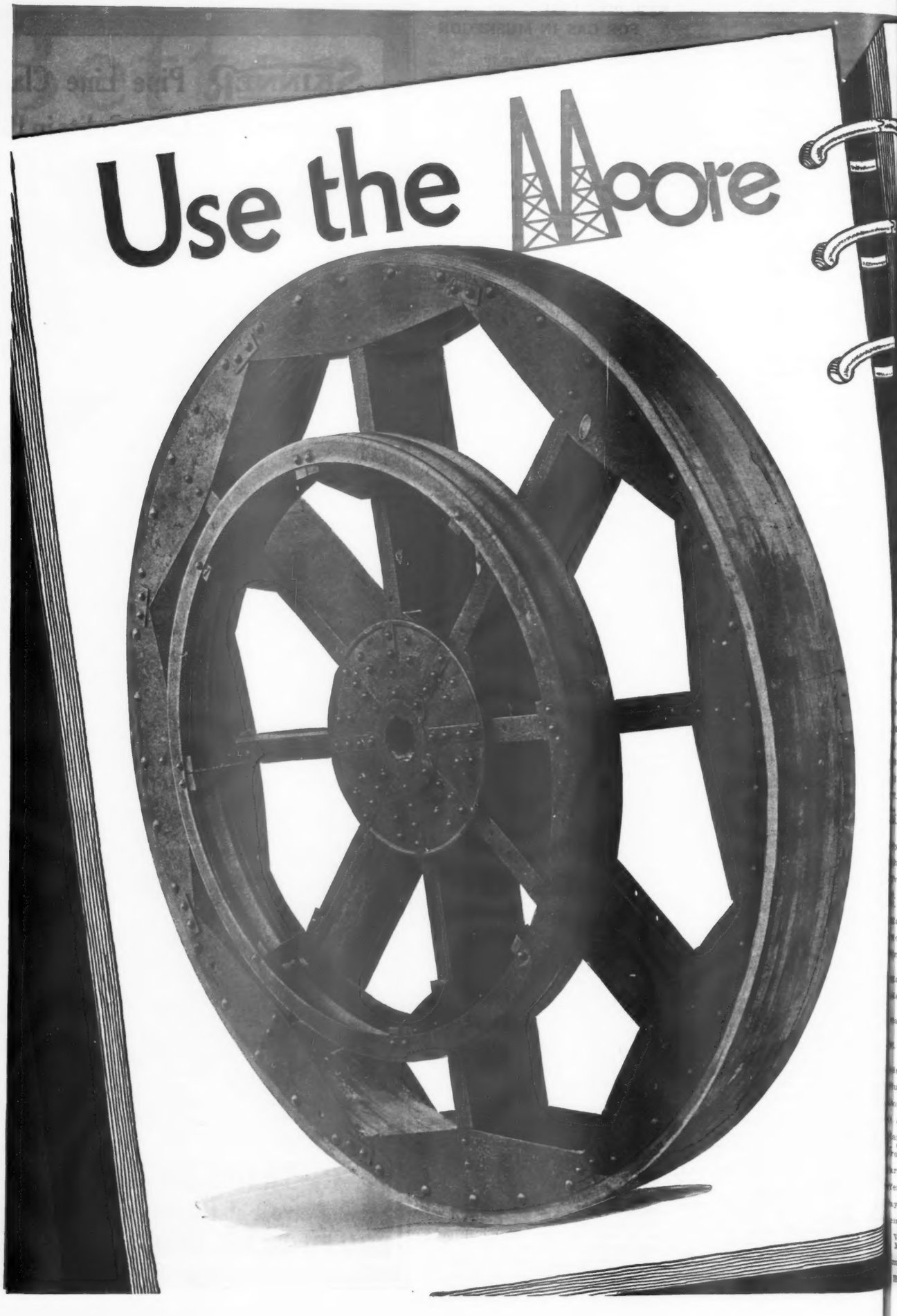
EMERGENCY PIPE CLAMP — SKINNER PIPE LINE CLAMP — SKINNER SERVICE SADDLE



SKINNER PIPE JOINT CLAMP — SKINNER COLLAR LEAK CLAMP — SKINNER H. P. SADDLE CLAMP

M. B. SKINNER CO.
Sample Street at Falcon Street
SOUTH BEND, INDIANA

SKINNER BAND CLAMP


Use the Moore

WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 52)

J. L. Slusher's No. 1 Nave, NE cor. SW NW Sec. 20-15-20 ..... Shut down 732 ft.

HUGHES COUNTY

Galt-Brown Oil Co.'s No. 1 Burrey, C NW NE Sec. 14-4-9. Dry and abandoned 4,101 ft.
Bager and others' No. 1 Penn, NW cor. SW NE Sec. 1-8-10 ..... Hole full water 4,025 ft.
Noble Oil & Gas Co.'s No. 1 Wicket, SE cor. SE Sec. 20-5-9 ..... Dry and abandoned 3,015 ft.
E. W. Whitney and others' No. 1 Moore, SE cor. SW Sec. 17-5-9 ..... Drlg. 2,420 ft.
Pure Oil Co.'s No. 1 Fixico, NE cor. SW Sec. 18-8-9 ..... Fishing 4,268 ft.
Howard Petroleum Co.'s No. 1 Gilbert, NW cor. SE Sec. 25-8-10 ..... Underreaming 3,240 ft.
Gypsy Oil Co.'s No. 1 McGirt, NE cor. NW SW Sec. 21-6-8 ..... Sand 3,310-30 ft., corrected, hole full water.
T. B. Slick, Inc.'s, No. 1 Epperly, NW cor. NE NW Sec. 32-6-8 ..... Dry in Wilcox, 4,655 ft., plugging back.

OKLAHOMA COUNTY

Slick & Bailey's No. 1 Koester, C SE NE Sec. 18-13-3w.. Shut down 4,510 ft.
Cromwell & Franklin's No. 1 Thompson, SW cor. NE NE Sec. 15-12-3w ..... Shut down 7,001 ft.
Cromwell & Franklin's No. 1 Gross, SW cor. NE SW Sec. 22-10-3w ..... Dry and abandoned 4,702 ft.
Indian Terr. Ill. Oil Co.'s No. 1 fee, C SE SE Sec. 24-11-3w ..... Drlg. 6,401 ft.

OKFUSKEE COUNTY

Moose & Daniels' No. 1 Stidham, SW cor. NW Sec. 4-11-10 ..... Shut down 622 ft.
Dixie Oil Co.'s No. 1 Drew, NE cor. SW Sec. 8-13-10.... Drlg. 2,945 ft.

SEQUOYAH COUNTY

Cooper & Badger's No. 1 Young, NW cor. NE NE Sec. 7-12-20 ..... Shut down 440 ft.
Hunt and others' No. 1 Unknown, SE cor. NW SW Sec. 12-12-23 ..... Shut down 635 ft.

PAWNEE COUNTY

Washoma Oil Co. and others' No. 1 Buffalo, SE cor. NE Sec. 33-22-5 ..... Cleaning out 3,194 ft.

POTTAWATOMIE COUNTY

Phillips-Atlantic's No. 1 Winrow, SW cor. NE NE Sec. 11-9-4 ..... Drlg. 3,122 ft.
Superior Oil Co.'s No. 1 Herminghausen, SW cor. NW NE Sec. 24-8-2 ..... Drlg. 4,927 ft.
Roxana Pet. Corp.'s No. 1 Lowe, SW cor. NW NE Sec. 17-6-5 ..... Cleaning out 4,920 ft.
Pure Oil Co.'s No. 1 Lindley, SE cor. SW SE Sec. 18-8-5.. Simpson sand 4,098-4,115 ft.; completed, pinched in.
T. B. Slick's No. 1 Sailor, SE cor. NW NW Sec. 12-8-3 .. Rigging rotary.
Roxana Pet. Corp.'s No. 1 Deister, NW cor. SE NE Sec. 20-6-5 ..... Dry and abandoned 4,271 ft.
T. B. Slick and Roxana Pet. Corp.'s No. 1 Hurst, SE cor. NW NW Sec. 17-7-2 ..... Cementing cave 5,520 ft.
Tomlinson et al's No. 1 Whisenhurst, NW cor. NE SE Sec. 35-7-5 ..... Drlg. 4,475 ft.
Phillips Petroleum Co.'s No. 1 Parman, SE cor. SW Sec. 15-8-4 ..... Drlg. 4,260 ft., corrected.
Champlin Refining Co.'s No. 1 Foster, SW cor. NE SW Sec. 14-7-5 ..... Standardizing 3,930 ft.

CADDO COUNTY

Magnolia Petroleum Co.'s No. 1 Shelby, SW cor. SW Sec. 28-10-12w ..... Dry and abandoned 4,472 ft.
J. V. Bailey's No. 1 Hubbard, C NE NW Sec. 1-10-6w.. Shut down 150 ft.
W. J. Hartley's No. 1 Galbreath, SE cor. NW SE Sec. 29-5-12w ..... Shut down 3,394 ft.
English Drilling Co.'s No. 2 Pruitt, CNL NW SE Sec. 22-6-10w ..... Rigged up and shut down.
Red Bank Oil Co.'s No. 1 Shanklin, C NW Sec. 15-12-11w. Drlg. 4,540 ft.

OSAGE COUNTY

Emerada Pet. Corp.'s No. 1, NE cor. SW Sec. 25-25-6 ... Dry and abandoned 2,925 ft.
White Eagle Oil & Ref. Co.'s No. 1, SE cor. NE Sec. 25-26-6 ..... Spudded.

STEPHENS COUNTY

Wade-Martin & Smythe's No. 1 Vestal, NE cor. SE Sec. 20-2-5w ..... Dry and abandoned 2,510 ft.
Kahl & Burris' No. 1 Jefferson, SE cor. NE NW Sec. 2-1-7w ..... Drlg. 1,510 ft.

SEMINOLE COUNTY

Prairie Oil & Gas Co.'s No. 1 Davis, NE SE Sec. 21-10-7.. Fishing 3,350 ft.
Superior and Fuhrman's No. 1 Fay, NW cor. SE SW Sec. 27-11-6 ..... Drlg. 4,468 ft.
Magnolia Pet. Co.'s No. 1 Germany, SE cor. NW Sec. 30-9-5 ..... Lowering casing 4,159 ft.
Phillips Pet. Co.'s No. 1 Miller, NW cor. SW Sec. 34-11-7 ..... Drlg. 2,700 ft.
Burke-Greis Oil Co.'s No. 1 Cyrus, SE cor. NE NW Sec. 13-9-7 ..... Underreaming 2,165 ft.
Harris and others' No. 1 Stidham, SE cor. NW Sec. 30-9-8 ..... Casing 3,822 ft.
T. B. Slick's No. 1 Wood, NE cor. NE SW Sec. 26-7-6.... Cromwell sand 3,314-20 ft., flowing 1,000 bbls.
T. B. Shaffer's No. 1 Carolina, SE cor. SW NE Sec. 4-6-7. Drlg. 4,702 ft.
E. W. Whitney's No. 1 Harjo, NE cor. NW NE Sec. 25-7-6 ..... Plugged back 4,325 ft., and shut down.
Gypsy Oil Co.'s No. 1 Andrews, NE SE NW Sec. 27-10-7 ..... Drlg. 3,530 ft.
Shaffer Oil & Ref. Co.'s No. 1 Catchochee, SW cor. SW NE Sec. 18-10-7 ..... Straightening hole 3,730 ft.
Prairie Oil & Gas Co.'s No. 1 Rogers, SE cor. NE SE Sec. 14-10-6 ..... Dry and abandoned 4,729 ft.
W. W. Adkins' No. 1 Reed, NE cor. NW Sec. 2-8-8 ..... Drlg. 900 ft.
T. B. Slick, Inc.'s, No. 1 Tiger, NW cor. SW NE, Sec. 13-8-5 ..... Drlg. 1,650 ft.
Magnolia Petroleum Co.'s No. 1 Sissy, SW cor. NE Sec. 32-8-7 ..... Drlg. 4,016 ft.
McCulloch Oil Co.'s No. 1 McGilbray, SW cor. SW NE Sec. 4-8-8 ..... Drlg. 550 ft.
Empire Gas & Fuel Co.'s No. 1 Harjo, SW cor. NW SE Sec. 17-7-6 ..... Hole full water, Wilcox 4,593-4,600 ft.
Garland Oil Co.'s No. 1 Strothers, NW cor. SE NE Sec. 5-10-7 ..... Rigging up.
Magnolia Pet. Co.'s No. 1 Carroll, SW cor. NW SE Sec. 1-7-5 ..... Location.

MAJOR COUNTY

Landau & Mooney's No. 1 Parker, SE cor. NE NW Sec. 4-23-16w ..... Show of oil 1,235 ft.; shut down.

WOODS COUNTY

H. K. Miller's No. 1 Copenhavers, NW cor. NW Sec. 18-24-13w ..... Rig.

MURRAY COUNTY

Mason Oil Co.'s No. 1 Labor, NW cor. NW Sec. 17-1-2 ...Drlg. 1,450.

DEWEY COUNTY

Buckaby & McCoy's No. 1 Perfect, NE cor. NE Sec. 9-18-15w ..... Fishing 4,345 ft.
Von Sifers' No. 1 Jordan, SW cor. NW Sec. 16-16-17w . Spudded and shut down.

BECKHAM COUNTY

J. & H. Petroleum Co.'s No. 1 Barnes, SW cor. NW NE Sec. 32-9-22w ..... Shut down 3,460 ft.
Martin and others' No. 1 Clack, NW cor. SE Sec. 1-8-25w. Drlg. 1,245 ft.
J. C. Hivicks' No. 1 Davis, C NW NE Sec. 4-11-26w ... Shut down 725 ft.
Producers Exploration Co.'s No. 1 Seidell, SE cor. SW SW Sec. 17-9-22w ..... Drlg. 2,575 ft.
Larson and others' No. 1 Danby, SW cor. SE NE Sec. 20-8-22w ..... Location.
Zerffel and others' No. 1-A Carter, NE cor. NE Sec. 35-9-22w ..... Shut down 1,500 ft.
Ray Oil Co.'s No. 1 Ault, NW cor. NW Sec. 38-8-21w ... Drlg. 450 ft.

GRADY COUNTY

Pennington and others' No. 1 Fryrear, SW SW NE Sec. 13-9-5w ..... Shut down 720 ft.
J. V. Bailey's No. 1 Hubbard, C NE NW Sec. 1-10-6w .. Spudded and shut down.
W. M. Henry and others' No. 1 Abrham, SE cor. NW Sec. 4-5-8w ..... Rig.
Commerce Development Co.'s No. 1 Taylor, C NE NW Sec. 4-3-7w ..... Testing sand 2,410-21 ft.
E. B. Nichols' No. 1 Brake, SE cor. NE SE Sec. 7-5-7w.. Shut down 2,307 ft.

UNDERWRITERS *of* NATURAL GAS SECURITIES

Inquiries Invited

ZWETSCH, HEINZELMANN & CO. Inc.

57 William Street New York, N.Y.

Definite Nation-Wide Facts

The Oil and Gas Journal is thorough.

It bases its reports on FACTS procured by staff men permanently located in their respective territories.

Oil and Gas Journal reports are checked and rechecked to make sure that you get ALL THE NEWS and then checked again to make sure that all the news is ABSOLUTELY CORRECT.

If you are interested in activities on a small lease out in the "sticks" or in knowing exact conditions in the several States or Nations, read The Oil and Gas Journal every week.

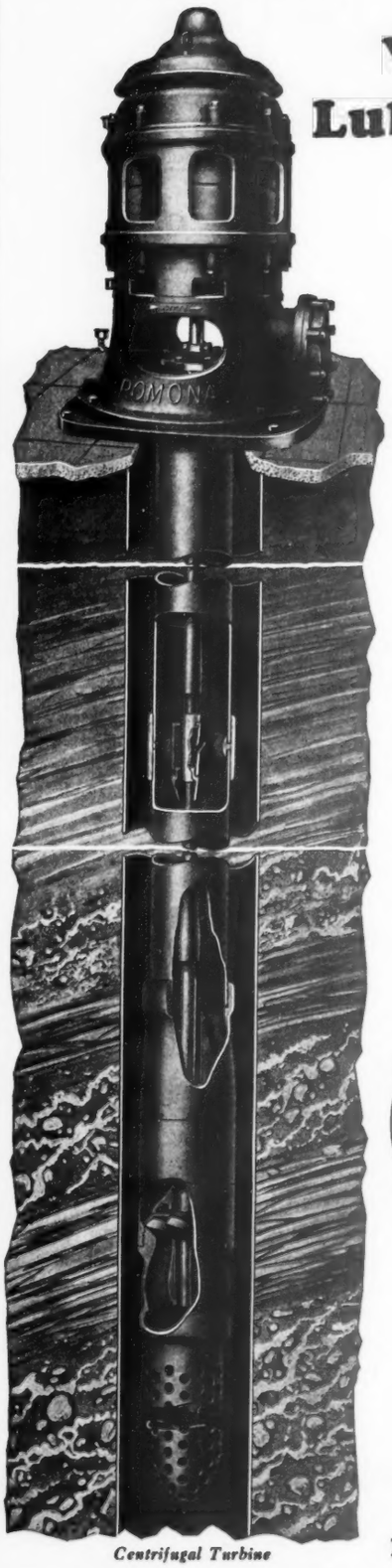
It will provide you with correct detailed information that you can use to good advantage in your business.

The Oil and Gas Journal
PRODUCING REFINING ENGINEERING MARKETING

TULSA, OKLA.
$6.00 a Year (52 issues)

Pomona Pumps Produce Cleanest Water

Water Lubricated



The bearings are water-lubricated below the surface.

Sand in the water will not cut the water-lubricated bearings.

Highest efficiencies — frequently 20% higher.

Cleanest water supply for Refineries, steam plants, domestic service, etc.

50 to 5,000 gallons per minute.

POMONA Oceans of Water PUMPS

Ask for Engineering Data

Pomona Pump Co.

Pomona, Calif.

Centrifugal Turbine

McINTOSH COUNTY

Marlone Oil Co.'s No. 1 Sanders, NW cor. NE SW Sec. 10-9-18 ..... Shut down 2,387 ft., corrected.
Patterson and others' No. 1 Smith, SW cor. NW SE Sec. 32-9-16 ..... Shut down 5,451 ft.
Wolfe and others' No. 1 Unknown, NW cor. SE Sec. 15-12-18 ..... Rig on ground.

CLEVELAND COUNTY

Daniels & LeWright's No. 1 Vandever, C SW Sec. 15--1w ..... Shut down 3,130 ft.

KIOWA COUNTY

Blue Mountain Oil Co.'s No. 1 Jones, SE cor. NW NW Sec. 17-5-14w ..... Shut down 530 ft.
Sloan-Russell's No. 1 Rushton, NE cor. SW SE Sec. 6-5-14w ..... Spudded.
J. M. Burke's No. 1 Fox, SW cor. NW Sec. 4-6-16w ..... Drlg. 885 ft.
Johnson & McDowell's No. 1 Thompson, SW cor. NE Sec. 6-6-15w ..... Drlg. 1,845 ft.
Dave Malernee's No. 1 Van Kirk, NW cor. NW Sec. 35-7-15w ..... Shut down 858 ft. in granite.
A. C. Varner and others' No. 1 Bonham, CSL NW NW Sec. 5-6-18w ..... Shut down 1,127 ft.

CUSTER COUNTY

W. E. Witts' No. 1 Wellman, C SE Sec. 1-14-14w ..... Rig and tools.

PONTOTOC COUNTY

Moore & Curran's No. 1 Allen, SE cor. SW SW Sec. 23-5-5 ..... Shut down 1,460 ft.
C. J. Shervin and others' No. 1 Wright, NW NE NE Sec. 13-4-6 ..... Wilcox corrected 3,565-70 ft.; dr and abandoned.
Roxana Pet. Corp.'s No. 1 Folsom, NW cor. SW Sec. 20-4-4 ..... Drlg. 875 ft.
Boles and others' No. 1 Rayburn, SW SE Sec. 35-4-6 .... Lost underreamer; abandoned a 1,340 ft.
Texas Pacific Coal & Oil Co.'s No. 1 Stewart, C SW NE Sec. 11-5-8 ..... Preparing to test Wilcox 3,435 ft
American Oil Refining Co.'s No. 1 Jones, NE cor. NE Sec. 18-5-5 ..... Drlg. 1,900 ft.

GARVIN COUNTY

R. F. Garland's No. 1 Strickland, SW NW SW Sec. 10-4-3 ..... Drlg. 3,264 ft.
Dixie Oil Co.'s No. 1 Perkins, SE NW Sec. 15-4-1 ..... Dry and abandoned 5,455 ft.

COMANCHE COUNTY

Jolly-Ogg Oil Co.'s No. 1 Neeley, SE NE Sec. 24-3-10w .. Dry and abandoned 3,014 ft.
Green and others' No. 1 Wilson, C NE SW Sec. 14-1-12w. Drlg. 3,988 ft.
Wirt Franklin Pet. Co.'s No. 2 Holler, NW cor. NW Sec. 2-4-11w ..... Drlg. 1,350 ft.

COAL COUNTY

McGraw and others' No. 1 Patton, SW SE NE Sec. 35-1-8 ..... Wilcox 4,770-93 ft., dry, pluggin back to show oil 1,790 ft.
Indian Territory Illuminating Oil Co.'s No. 1 Harris, SW cor. NW Sec. 10-1-11 ..... Drlg. 4,660 ft.
Robert Galbreath and others' No. 1 Jones, SW cor. SE Sec. 24-1-9 ..... Shut down 1,595 ft.

PITTSBURG COUNTY

McAylor and others' No. 1 Reed, NW cor. SW NW Sec. 7-6-14 ..... Drlg. 1,320 ft.

JACKSON COUNTY

Atlus Oil Co.'s No. 1 Northington, NE cor. NE Sec. 4-1-20w ..... Shut down 735 ft.

SOUTHERN OKLAHOMA

BRYAN COUNTY

Alexander & Oppenheimer's No. 1 Hampton, SE cor. NE Sec. 26-7s-11 ..... Shut down 1,425 ft.

MURRAY COUNTY

Alter and others' No. 1 Johnson, SW cor. NW Sec. 14-4-7. Spudded and shut down.

COTTON COUNTY

Cuyler & Pyson's No. 1 Thomas, SE cor. SE SW Sec. 16-4-12w ..... Drlg. 1,685 ft.
G. E. Crane and others' No. 1 Montgomery, C NW NE Sec. 33-2s-9w ..... Shut down 3,510 ft.

JEFFERSON COUNTY

Fritz and others' No. 1 Barrett, C SE SE Sec. 5-65-7w... Drlg. 1,736 ft.
Amerada Petroleum Corp.'s No. 1 Emerson, NW cor. SE SW Sec. 28-5s-8w ..... Shut down 4,516 ft.

CHOCTAW COUNTY

Choctaw Petroleum Co.'s No. 1 Wilson, SW cor. SW Sec. 15-6-19 ..... Shut down 1,346 ft.

TILMAN COUNTY

Bray and others' No. 1 Barker, NE cor. SW NW Sec. 9-1-15w ..... Shut down 805 ft.
Dixie Oil Co.'s No. 1 McKinney, NE cor. NE Sec. 29-3s-18w ..... Location.
A. N. Pearson's No. 1 Mounts, SW cor. SW Sec. 3-5s-15w. Corrected; drlg. 1,845 ft.
Stanley & McGregor's No. 1 Mock, NW cor. NW SW Sec. 33-1-20w ..... Shut down 1,641 ft.
Landfair and others' No. 1 Smith, SE SW SE Sec. 6-2s-15w ..... Shut down 2,485 ft.

JOHNSTON COUNTY

Wapanucka Oil Co.'s No. 1 Banks, Sec. 28-2s-9 ..... Shut down 1,?90 ft.
Bush Creek Oil Co.'s No. 1 Kirby, SE cor. NE NW Sec. 9-4-7 ..... Shut down for casing 405 ft.
Smith & Kinsley's No. 1 Lane, SE cor. NW Sec. 29-1-7.. Drlg. 1,080 ft.
Yale Oil Syndicate's No. 1 Craige, C NW NE Sec. 36-9s-9e ..... Location.
Sullivan and others' No. 1 Wines, NW NE NW Sec. 11-7s-5e ..... Drlg. 375 ft.
E. J. Stump and others' No. 1 McGinnis, SW Sec. 26-3s-8w ..... Rig.
McCraw and others' No. 1 Trust, SW Sec. 12-1s-8e ..... Rig.

KANSAS WILDCATS

(Continued from Page 54)

Mid-West Exp. Co.'s No. 1 Austin, NE cor. NE Sec. 36-12-16w ..... Casing trouble 3,060 ft.
Marland Oil Co.'s No. 1 Vine, SW cor. SW SE Sec. 27-11-19w ..... Drlg. 1,650 ft.
Stearns & Streeter's No. 1 Plummer, NW cor. SE Sec. 2-11-17w ..... Oswalt lime 3,024-39; 60 bbls. d
T. B. Slick, Inc.'s No. 1 Craig, C NW NE Sec. 8-11-16w.. Drlg. 2,916 ft.

EDWARDS COUNTY

Amerada & Wilcox' No. 1 Teasail, C NW SW Sec. 32-25-19w ..... Drlg. 3,525 ft.

GEARY COUNTY

Pioneer Oil Co.'s No. 1 Chase, SE cor. SE Sec. 10-12-7.... Drlg. 3,502 ft.
Wright et al's No. 1 Younker, NW cor. NE Sec. 17-11-5.... Drlg. 1,074 ft.

GRAHAM COUNTY

Gulf Coast Oil Co.'s No. 1 Johnson, C S half Sec. 27-8-25w ..... Drlg. 2,450 ft.

GREENWOOD COUNTY

Bisagno et al's No. 1 Gilroy, NW cor. SW SW Sec. 8-25-13 ..... Dry and abandoned 1,642 ft.
P. H. Ballew's No. 1 Bright, NE cor. SW Sec. 22-27-13.... Shut down 1,210 ft.
Ladow Gas Co.'s No. 1 Lawrence, SE cor. SW SE Sec. 4-27-13 ..... Dry and abandoned 1,630 ft.
Ward McGinnis' No. 1 Robbins, NE cor. NW Sec. 16-24-9.. Dry and abandoned 2,555 ft.
Hanley et al's No. 1 Peterson, NW cor. NE SE Sec. 4-26-13 ..... 1,000,000 ft. gas, 1,528-31 ft.; co pleted.

HARPER COUNTY

Amerada Pet. Corp.'s No. 1 Mendiville, C E SE Sec. 24-34-6w ..... Fighting cave 5,360 ft.

HARVEY COUNTY

R. S. Austin's No. 1 Nieman, SW cor. SW Sec. 21-24-2.... Drlg. 2,245 ft.

JEFFERSON COUNTY

Wichita Oil Co.'s No. 1 Simpson, NW cor. SW SW Sec. 19-10-17 ..... Rigged up and shut down.

JACKSON COUNTY

Garvin & Morton's No. 1 Lutes, SW cor. NW NW Sec. 27-7-15 ..... Shut down 940 ft.

LANE COUNTY

Blankenship Pet. Co.'s No. 1 Schaeffer, NE cor. NE Sec. 24-16-28w ..... Rig.

LYON COUNTY

T. K. Simmon's No. 1 Milner, SE cor. NW Sec. 35-21-11.. Drlg. 1,905 ft.

MARSHALL COUNTY

Irwin et al's No. 1 Cooper, NE cor. NW Sec. 10-3-7 ..... Drlg. 620 ft.

MARION COUNTY

Prairie O. & G. Co.'s No. 1 Theis, NW cor. NW Sec. 18-19-4 ..... Dry and abandoned 2,715 ft.
Empire Oil & Ref. Co.'s No. 1 Burhart, SE cor. NE NE Sec. 11-20-3 ..... Drlg. 945 ft.
E. E. Hauna's No. 1 Pankratz, NE cor. NE SW Sec. 13-20-3 ..... Rig.
Empire Oil & Ref. Co.'s No. 1 Jenson, SE cor. NW Sec. 26-22-5 ..... Rig.
Courtney B. Davis' No. 1 Rampel, SE cor. NE SE Sec. 7-19-3 ..... Chat 2,424-58 ft., 8,000,000 gas spraying 5 bbls. oil per hour.
A. E. Meyers, No. 1 Papp, SW cor. SW NE Sec. 10-18-2.. Spudded.
Raymond Gear's No. 1 Larson, NW cor. SW NW Sec. 18-21-4 ..... Shut down 2,330 ft., corrected.
Empire Oil & Ref. Co.'s No. 1 Siebert, SW cor. SE Sec. 28-20-2 ..... Sand 2,425-27 ft., 1,500,000 ft gas, shut in.

MEADE COUNTY

Blackwell O. & G. Co.'s No. 1 Beyer, SE cor. NW SE Sec. 9-33-28w ..... 500,000 ft. gas and 2 bailers water total depth 4,356 ft.

MITCHELL COUNTY

Ben Gurley et al's No. 1 Crombil, C NE NE Sec. 32-9-7w ..... Drlg. 3,575 ft.

MORRIS COUNTY

Hugh Faulder's No. 1 Wendt, SW cor. SE SE Sec. 18-15-5 ..... Spudded.
Loomis & Anderson's No. 1 Young, NW cor. SE, Sec. 14-17-7 ..... Drlg. 1,730 ft.
Skelton et al's No. 1 Iles, NW cor. NW Sec. 25-16-5..... Rig.
General Utilities Co.'s No. 1 Sanford, NE cor. NE Sec. 15-16-7 ..... 3,000,000 ft. gas 1,436-38, shut in.
O'Day et al's No. 1 Scott, NE cor. SW Sec. 6-16-6 ..... Rig.

McPHERSON COUNTY

Galt-Brown's No. 1 Blaine, C NE Sec. 18-17-1w ..... Drlg. 3,362 ft.
Ted Washabaugh's No. 1 Vosshell, NE cor. NE Sec. 9-21-3w ..... Drlg. 520 ft.
Arliaux et al's No. 1 Martinson, NE cor. Sec. 9-19-3w... Rig.
McPherson Gas Co.'s No. 1 Stein, SW cor. NE SW Sec. 17-18-1w ..... Drlg. 2,263 ft.
McPherson Gas Co.'s No. 1 Gustafson, C NE Sec. 9-17-2w ..... Drlg. 2,650 ft.
T. C. Newman's No. 1 Diepenbrock, NW cor. NE Sec. 2-17-1w ..... Drlg. 3,010 ft.
McPherson Gas Co.'s No. 1 Wedell, C SW Sec. 12-20-2w ..... Drlg. 890 ft.
Vickers Pet. Co.'s No. 1 Wedel, C SW Sec. 12-20-2w..... Rig.

OSAGE COUNTY

York State Oil Co.'s No. 1 Smith, SE cor. SW NW Sec. 18-18-15 ..... Drlg. 2,005 ft.

OSBORNE COUNTY

T. C. Johnston's No. 1 Cooley, C NW NE Sec. 15-8-15w... Underreaming 3,225 ft.
J. D. Jarvis' No. 1 Jellison, SE cor. SE Sec. 13-10-15w... Spudded and shut down.

OTTAWA COUNTY

Anderson et al's No. 1 Bank, NE cor. NW Sec. 28-10-2w.. Drlg. 2,750 ft.

PAWNEE COUNTY

T. C. Troupe's No. 1 Lovett, CEL NE NE Sec. 31-21-16w. Shut down 1,560 ft.

PHILLIPS COUNTY

Patsonian Oil Co.'s No. 1 Marklein, NE cor. SW Sec. 21-3-19w ..... Drlg. 2,450 ft.

RENO COUNTY

Empire and Marland's No. 1 Williams, SE cor. NE Sec. 5-26-4w ..... Dry and abandoned 4,144 ft.

RICE COUNTY

Allison & Fitzwilliams' No. 1 Poland, NE cor. SW NE Sec. 36-19-8w ..... Cellar.

ROOKS COUNTY

Phillips Pet. Co.'s No. 1 Overholtzer, C SE Sec. 20-9-16w.. Dry and abandoned 3,665 ft.
Empire G. & F. Co.'s No. 1 Woodrill, NE cor. SE NW Sec. 15-8-18w ..... Drlg. 3,116 ft.
Prairie Oil & Gas Co.'s No. 1 Sandberg, C SW Sec. 20-9-18w ..... Rig.
Krueger et al's No. 1 Poore, NE cor. NE Sec. 14-8-16w... Drlg. 1,911 ft.
Burford & Brimm's No. 1 Toxa, NE cor. SW SE Sec. 22-19-17w ..... Spudded and shut down.
Krueger et al's No. 1 Poors, NE cor. NE Sec. 14-8-16w.. Drlg. 2,730 ft.
Kelly & Mid-West's No. 1 Jones, SW cor. NE NW Sec. 28-7-16w ..... Shut down 3,485 ft.

RUSH COUNTY

Danciger Valerius & Chenney's No. 1 Schuerman, NW cor. SE NW Sec. 27-17-17w ..... 11,000,000 ft. gas 3,575-79 ft.
Sinclair Oil & Gas Co.'s No. 1 Berching, NW cor. NE NW Sec. 9-16-16w ..... Drlg. 1,450 ft.

RUSSELL COUNTY

Douglas Oil Co.'s No. 1 Stoppel, SE cor. SW NE Sec. 25-14-11w ..... Dry and abandoned 3,505 ft.
Gypsy Oil Co.'s No. 1 Cook, C NE SE Sec. 10-13-15w .... Dry and abandoned 3,448 ft.
Kearns & Streeter's No. 1 Haise, NE cor. SE SE Sec. 36-12-15w ..... Shut down top Oswalt lime 2,974 ft.
Joe Liggett's No. 1 Maier, SE cor. NE SE Sec. 8-11-15w.. Top Oswalt 3,016 ft.; show oil and water drlg. 3,280 ft.

SALINE COUNTY

J. Esty et al's No. 1 Peterson, C NE Sec. 6-16-5w..... Spudded and shut down.
Doyle et al's No. 1 Miller, SW cor. SE Sec. 21-16-1w..... Drlg. 2,040 ft.
Nathan Jones et al's No. 1 Robertson, NW cor. SW Sec. 27-14-2w ..... Shut down 1,500 ft.

SEDGWICK COUNTY

A-Vi-Bar Pet. Co.'s No. 1 Wright, SE NE SE Sec. 12-26-1w ..... Sand 3,367-68 ft., flowing 1,700 bbls. daily.
A-Vi-Bar et al's No. 1 Roberts, SE cor. SW Sec. 1-26-2w ..... Rig.
C. B. Shawver et al's No. 1 Broels, NE cor. SW Sec. 5-26-2e ..... Rig.
Lewis et al's No. 1 Taylor, NW cor. NE Sec. 23-27-2 .... Rig.
H. Tatlock et al's No. 1 Goeldner, NW cor. NE Sec. 6-29-2e ..... Drlg. 1,725 ft.
A. Robb Oil Co.'s No. 1 Davis, SE cor. SE Sec. 36-25-1w.. Drlg. 1,975 ft.
Anglason et al's No. 1 Buckles, NW cor. SE Sec. 3-28-1w.. Shut down 250 ft.
Arnsdall Oil Co.'s No. 1 Faber, SW cor. NW Sec. 6-27-1w ..... Underreaming 1,750 ft.
A-Vi-Bar Pet. Co.'s No. 1 Steel, SE cor. SE Sec. 1-26-2w. Drlg. 1,700 ft.
Kimmell & Slick's No. 1 Cross, NE cor. NE Sec. 27-25-1w.. Drlg. 1,000 ft.
Allison & Fitzwilliams' No. 1 Doane, NE cor. NW NE Sec. 24-26-1w ..... Drlg. 3,440 ft.
VanZant & Mason's No. 1 Fox, C NW SW Sec. 19-25-1w.. Drlg. 1,450 ft.
Arnsdall Oil Co.'s No. 1 Samuels, NE cor. NW Sec. 24-25-1 ..... Casing trouble 1,328 ft.
Garland Prod. Co.'s No. 1 Goodrich, SW cor. NE SW Sec. 16-25-1 ..... Rig.

SEWARD COUNTY

J. Sidwell et al's No. 1 Kelly, SW cor. NE Sec. 16-34-33w ..... Shut down 1,213 ft.
McKanna et al's No. 1 Haun, SE cor. NE Sec. 10-33-33w.. Shut down 1,440 ft.
J. B. Slick's No. 1 Pyle, NE cor. NE Sec. 14-33-33w..... Dry and abandoned 5,036 ft.

SHERMAN COUNTY

J. L. Henson et al's No. 1 Murry, NE cor. SE NW Sec. 27-7-40w ..... Shut down 3,035 ft.

STEVENS COUNTY

Texas Oil Co.'s No. 1 Thompson C NE SW Sec. 3-35-33w.. Casing trouble 600 ft.

SUMNER COUNTY

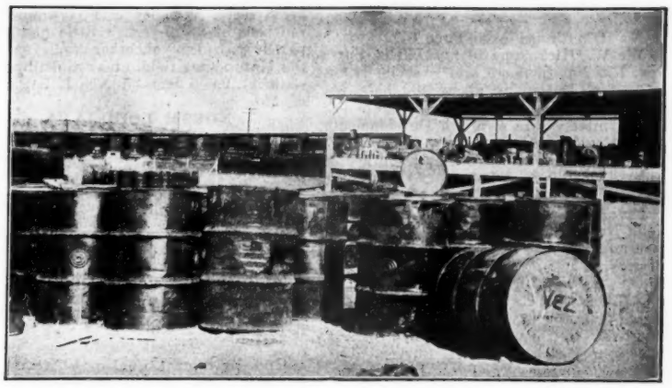
McCulloch Oil Co.'s No. 1 Teettle, SW cor. NE Sec. 29-34-1w ..... Drlg. 3,560 ft.
Gypsy Oil Co.'s No. 1 Williams, NW SE SW Sec. 16-35-3w ..... Drlg. 3,712, hole full water.
Kimmerich & Paynes' No. 1 Warlick, SE cor. NE Sec. 8-34-2 ..... Drlg. 2,625 ft.
Elliot et al's No. 1 Barlow, SE cor. SE Sec. 22-33-3w... Wilcox 4,479-4,482 ft., show oil and gas.
George Dickey's No. 1 Knox, SW cor. NE Sec. 3-35-1w... Drlg. 3,900 ft.
Elliot et al's No. 1 Volker, NW cor. NE Sec. 9-35-1..... Rig.
Davidson and others' No. 1 Strickland, SW cor. SE Sec. 12-35-1w ..... Rig.
John Jarvis' No. 1 Warnecke, SE cor. SW Sec. 4-34-2w... Dry and abandoned 4,686½ ft.

TREGO COUNTY

Central Commercial Oil Co.'s No. 1 Ellis, NE cor. SW NE Sec. 20-13-21w ..... Drlg. 2,125 ft.

WASHINGTON COUNTY

Cool & Vincent's No. 1 Linn, NW cor. NE Sec. 27-4-3.. Rig.



·VEZ·

PATENTS PENDING

THE steady insistence among oil producers that their cut oil be treated with VEZ is a striking tribute to the standards of quality we so carefully maintain. In delivery, users have the advantage of shipment from stock so located as to minimize freight charges. The Vez Company is organized for service and its sole aim is to serve you better.

"ASK · THE · MAN · WHO · USES · IT"

Representatives in Principal Fields

Bristow, Oklahoma · Earlsboro, Oklahoma · El Dorado, Kansas · Tullos, Louisiana
Wichita Falls, Texas · Breckenridge, Texas · Wink, Texas · Borger, Texas
Benavides, Texas · El Dorado, Arkansas · Seal Beach, California

◆ ◆

The Vez Company

MANUFACTURING CHEMISTS
VEZ *Oil Treating Process*
PATENTS PENDING
DALLAS, TEXAS

2221-3 Laws Street · Telephone 7-4530

SOUTHWEST TEXAS

(Continued from Page 61)

1 W. W. Hickman, Gerren Hinds Survey, 150 feet to north and west lines, at 2,716 feet is flowing about 400 bbls. of oil through 6⅝-inch casing, tubing to be set. United North & South Development Co.'s No. 1 K. C. Baker, A. Floyd Survey, 150 feet to northeast and southeast lines, is drilling at 800 feet.

Lockhart Area

Pat Armstrong's No. 1 Heidenheimer, John R. Miller Survey, 450 feet to north line and 150 feet to east line, is building derrick.

Luling Field—Guadalupe

A. B. A. Oil Co.'s No. 4 Britton Harris is standing at 1,250 feet for repairs. Magnolia Petroleum Co.'s No. 7 J. M. Roberts, Harriett Cottle Survey, 150 feet to southwest and southeast lines, is drilling at 1,860 feet; No. 4 N. J. Carter, Harriett Cottle Survey, 150 feet to northwest and northeast lines, has been completed at 2,154 feet.

Kingsville Field—Kleberg

Humble Oil & Refining Co.'s No. 4 Flato, Section 40, Lot 10, located 250 feet to east line and 450 feet to north line, at 2,895 feet has set 9⅝-inch casing, total depth 2,905 feet, to test sand cored showing oil.

Cartwright Field—Live Oak

Houston Oil Co.'s No. 1-A Brown Land & Cattle Co. is location in M. B. Kibbin grant.

Three Rivers Field

W. J. Walton's No. 3 C. H. Wedding, 300 feet west of No. 3, is coring a sand at 1,578 feet.

Agua Dulce Field—Nueces

Alexander and others' No. 1 J. J. Eliff has spudded in and set surface casing; No. 2 J. J. Eliff is location. Davis-Horn and others' No. 1 Thomas Ragland, Mantor & Briggs Subdivision, SW cor. of Lot 13, has set surface casing at 416 feet. Agua Dulce Oil & Gas Co.'s No. 1 John O. Sponberg, George H. Paul Subdivision, SW SW, Section 87, at 2,029 feet, casing set at 2,022 feet, is drilling in. R. & G. Corp.'s No. 1 Ed Allen, Ross Peters Subdivision, Section 6, Block 6, is drilling at 2,500 feet.

Saxet Gas Field

Saxet Gas Co.'s No. 4 Weil has derrick up and is moving in tools. No. 5 Dunn is location 1,500 feet southwest of No. 1 Dunn.

Refugio Pool—Refugio

Benedum & Trees' No. 2 Claude Heard, Block 1, C. Heard Survey, 300 feet west of No. 1, is drilling at 1,730 feet; No. 3 Claude Heard, 300 feet south of No. 1, is drilling at 1,020 feet. Houston Oil Co.'s No. 9 F. B. Rooke, T. Mullen Survey, 150 feet to south and east lines, is drilling at 2,210 feet; No. 10 F. B. Rooke, 2,000 feet northwest of discovery oil well, at 3,512 feet cored sand showing oil in core and will make a drill stem test; No. 11 F. B. Rooke, T. Mullen Survey, 150 feet to east line and 350 feet to south line, is drilling at 1,980 feet; No. 4 Wilson Heard, northeast offset to discovery oil well, at 4,992 feet tested salt water with cement thrown up with water and thought to indicate it failed to set.

Houston Gulf Gas Co.'s No. 3 Rea is location. William F. Morgan's No. 1 Leslie Adkins, Refugio town tracts, Lot 4, Block 10, located 150 feet to north and east lines of lot, is location. W. L. Pearson's No. 1 Mitchell, 600 feet north of Refugio town lots, 250 feet west of Goliad road, is drilling at 3,771 feet in shale showing oil. Pat Rutherford and W. L. Pearson's No. 1 J. M. O'Brien is drilling at 4,340 feet.

LA.-ARK. WILDCATS

(Continued from Page 57)

to the Marshall Lumber Co. which is reported to have a lumbering and colonization scheme under way but first will start a deep hole at an early date to make a new test of shows that have been obtained at different levels in previously drilled wells in that general locality.

The Dixie Oil Co. cemented 9-inch casing at 3,409 feet on its deep test in Claiborne Parish, No. 1 Gilbert in Section 27-21-5, about 15 miles east of Homer production and is drilling shale at 3,835 feet. Woodley & Fox topped the red beds at 2,790 feet, a little high compared with logs of other wells east of the Monroe gas field, and are drilling red shale at 2,905 feet on No. 1, northwest of Monroe.

NORTH LOUISIANA

Bienville Parish

W. G. Gray, trustee, is drilling No. 1 Johnson, Section 21-18-6, at 1,400 feet.

Bossier Parish

Nell & Lanier have made location 200 feet north and west SE cor. Section 23-21-14 for No. 1 Biedenharn. Triangle Drilling Co. and Empire Gas & Fuel Co.'s No. 1 Bulkley in Section 9-20-13, is drilling at 3,953 feet. Woodley Petroleum Co.'s No. 1 Whitehurst, Section 36-16-12, is drilling at 2,330 feet.

Caddo Parish

Gulf Refining Co.'s No. 1 Attaway in Section 1-18-15, is drilling shale and lime at 3,564 feet. Tidal Oil Co.'s No. 1 McCrary, Section 23-19-16, is shut down at 1,425 feet.

Claiborne Parish

Dixie Oil Co. is drilling shale at 3,737 feet on No. 1 Gilbert in Section 27-21-5. It cemented 9-inch casing at 3,408 feet. El Dorado Chief Oil Co.'s No. 1 Baker, Section 26-20-7, is in shale and boulders at 1,800 feet.

DeSoto Parish

Benedum & Trees Oil Co. is drilling at 2,020 feet on No. 1 State, Section 22-14-12. Luke Case, trustee, set 10-inch surface pipe at 103 feet on No. 1 Boatright, Section 3-10-13. R. O. Roy got a small show of gas at 2,834 feet in No. 1 Whitaker, Section 5-13-13, and is reaming to bottom. Rudeaele and others have rig up for No. 1 Nabors, 350 feet south and 2,650 feet west NE cor. Section 6-12-11.

East Carroll Parish

Palmer Corp.'s No. 1 Carroll Land Co., Section 21-19-11, cemented 6-inch casing at 2,868 feet.

Franklin Parish

Davis and others' No. 1 Moore, Section 12-11-6, is shut down at 1,000 feet.

Monroe District

Ouachita Parish — Ouachita Natural Gas Co. is drilling in sand rock at 3,722 feet on No. 2-B D'Arbonne, Section 25-19-2e.

Union Parish—Carter & Wingfield's No. 3 Hudson, Section 7-23-1e, is drilling gumbo at 1,425 feet; No. 3 Security Trust, Section 23-23-1e, is drilling at 2,720 feet. H. C. McDonald is fishing for rotary slip dropped into the hole on No. 1 United States, Section 18-23-1e, total depth 2,140 feet. Woodley & Fox are drilling No. 1 McLeod, Section 13-19-1e, at 2,647 feet.

Richland Parish

Richland Operating Co.'s No. 1 Traylor, Section 24-16-6, is in shale at 1,900 feet.

Sabine Parish

W. G. Doerne's No. 1 Pickering, Section 17-4-11, is drilling at 4,395 feet. The Texas Company's No. 1 Hamlin, Section 28-10-13, is drilling lime at 3,830 feet.

Tensas Parish

Enochs and others' No. 1 Curry, Section 39-11-12, is shut down for orders after testing hot salt water at 3,569 feet.

ARKANSAS

Ashley County

Atlantic Oil Producing Co.'s No. 1 Moffatt, Section 28-16-8, is shut down waiting for fuel, total depth 3,731 feet. J. G. Marcum and others' No. 1 DeYampert, Section 5-19-4, is drilling at 1,805 feet.

Calhoun County

Amerada Petroleum Corp. is coring No. 1 Matlock, Section 10-12-13, at 3,700 feet. J. B. Hurley has derrick up for No. 1 Arkansas Timber Co., 689 feet south and 341 feet west of the center of Section 29-16-12.

Chicot County

Crawford and others are drilling shale and gumbo at 2,150 feet on No. 1 Cashion, Section 14-18-2w. S. D. Hunter's No. 1 Sawyer, Section 19-18-2w, is in red shale at 3,234 feet.

Logan County

Arkansas Natural Gas Co. is sidetracking 8¼-inch casing in No. 1 Parks, Section 26-8-24, total depth 2,407 feet.

Miller County

Edgar A. Martin, trustee, has made location 100 feet north and 200 feet west SE cor. NW SW, Section 23-15-26, for No. 4 Dale.

Union County

El Dorado—Calgo Oil Co. has gone back to No. 1 Primm, Section 25-18-15, to deepen, and is drilling at 3,265 feet. McDonald Brothers' No. 1 Mayfield, Section 29-19-15, is shut down at 1,983 feet. Starke and others' No. 1 Powell, Section 35-18-15, was dry on drill stem test at 2,146-83 feet.

Lawson—Morefield & Tate are drilling No. 1 Smith, Section 6-18-13, at 2,907 feet.

Lisbon—Imperial Oil & Gas Products Co.'s No. 1 Goodwin, Section 26-17-16, tested salt water at 2,965-2,700 feet and is coring.

EAST TEXAS

Bowie County

Hooks Oil & Gas Co. has temporarily abandoned No. 1 Rosenberg in the L. T. King Survey at 3,086 feet.

Cass County

Davis & Piggs' No. 1 Lambert in the William Lambert Survey, is temporarily abandoned at 1,952 feet.

Shelby County

Chapparall Oil Co.'s No. 2 Holt in the Matthew Moore Survey is drilling broken lime at 1,807 feet. Gulf Refining Co. mudded off 5,000,000 feet of gas at 3,245 feet in No. 1 Pickering in the P. W. Harvey Survey and is drilling hard gray lime at 3,311 feet.

SOUTHWEST WILDCATS

(Continued from Page 61)

Henry Manton Survey, 920 feet to north line and 660 feet to east line, is standing at 214 feet. Robert A. Rodson's No. 1 Glasscock, Survey 50, located 150 feet to CEL, is drilling at 928 feet in sandstone.

Caldwell County

Fred Adams' No. 1 Burney, Gideon Pace Survey, is drilling at 1,440 feet. Bartlett Brothers' No. 1 C. N. Martindale, William G. Steffey Survey, 490 feet to northeast lines and 972 feet to northwest lines, is shut down at 1,392 feet. John V. Edwards' No. 1 W. C. Caldwell, Cornelius Crenshaw Survey, 300 feet to east line and 600 feet to south line, is moving in machinery. The Texas Company's No. 1 D. T. Lackey, George W. James Survey, 880 feet to southeast lines and 450 feet to southwest lines, is location. Russell-Hill's No. 1 Hill, McCullough Survey, is drilling at 175 feet.

Comal County

George Kruger's No. 1 Uecker, A. Gaytean Survey No. 198, located in SE cor., is drilling at 1,000 feet.

Colorado County

National Oil Co.'s No. 1 H. T. Brandt, Freeman Pettus league, 150 feet to south line and 1,000 feet west of highway, is location.

Dimmitt County

G. W. Morgan's No. 3 City National Bank Co., Section 25, is location 600 feet east of No. 1.

Edwards County

McMan Oil & Gas Co.'s No. B-1 Walter Schreiner, H.E.&W.T.Ry. Survey, Section 50, Block F, 330 feet to south and east lines, is shut down at 2,130 feet. Gail Oil Co.'s No. 1 Neal Jergin, G.C.&S.F.Ry. Survey No. 2, located 1,000 feet to the north line and 740 feet to the east line, is setting casing at approximately 2,000 feet.

Frio County

Pilgrim Oil Co.'s No. 2 Blackaller, James Gouley Survey, is at 3,218 feet waiting on rock bit.

Fayette County

Marshall & Moore's No. 1 John A. Kerr, M. Muldoon league No. 5, about 250 varas to north line of league and little west of the center, is drilling at 1,940 feet. National Oil Co.'s No. 1 J. C. Melcher, S. M. Williams league No. 1, located 300 feet to north and east lines, is rigged up. R. E. Phalon's No. 1 Cervenka, Fayette County School League, 450 feet to south line and 150 feet to east line, is drilling at 2,502 feet.

Goliad County

J. E. Alexander's No. 1 Campbell, Goliad Survey, Block 7, located 315 feet to north line and 327 feet to east line, is shut down at 825 feet. McCars and others' No. 1 Broyles, Goliad To site, is drilling at 400 feet.

Gonzales County

Alexander & Smith's No. 1 Billi G. Gwinn Survey, is location in nor west corner. Joe Bruner's No. 1 R. & J. C. Miller, Richard Heath Surv 3,040 feet to north line and 200 feet east line, has been spudded in. Geo Sullivan's No. 1 Norwood, Winsl Turner Survey No. 3, located 2,080 to northeast lines and 2,410 feet to nor west lines, is shut down at 705 feet.

Guadalupe County

Brodie and others' No. 1 B. B. L Ira Nash Survey, 610 feet north of r and 320 feet to east line, has derr up and rig moving in. J. J. Christ No. 1 Taylor Thomas, Gustavus C well Survey, 1,130 feet to southeast li and 1,100 feet to southwest lines, is dr ing at 923 feet. T. H. Poole's No. 1 Woehler, John King Survey, 310 fee north line and 210 feet to east line rigged up and standing.

Hays County

Estess-Moore & King's No. 1 C. Sledge, Hunton & Jones Survey, 285 to northwest lines, is standing at feet.

Jackson County

J. B. Douglas' No. 1 C. O. Lowra John McHenry Survey, 720 varas northwest lines and 3,700 varas to sou west lines, is shut down at 3,030 The Texas Company's No. 1 W. C. Mo I.&G.N. Survey No. 208, located 5 feet to south line and 150 feet to w line, is in sandy shale at 2,727 Wright Brothers' No. 2 Classen, 1 feet north 10 degrees west of No. 1 standing at 3,200 feet; No. 7-A Drus T. Rodriguez Survey, 900 feet due of No. 3, is preparing to test at 3 feet.

Jim Wells County

Cushing Oil & Gas Co.'s No. 2 Perez, La Tinaja de Lara grant, 4 feet to west line and 455 feet to no line, is in gumbo at 2,200 feet and dr ing.

Karnes County

Frank M. Swacker's No. 1 Butler, feet south 45 degrees east of Earl Reynolds' No. 2 Butler, is drilling 1,570 feet in tough gumbo.

Kinney County

Mardon Oil Co.'s No. 1 Jim Cla Survey 346, Section 1,492, has ab doned idea of shooting at 1,973 feet is starting to deepen to the Edwards.

Maverick County

Thomas Johnson's No. 1 Wipff standing at 900 feet. Ryan Consolida Petroleum Co.'s No. 2 Indio Ranch, S vey 7, A. Rivas NE cor., is drill at 325 feet. Rycade Oil Corp.'s N Chittim, 175 feet north of No. 1, derrick up; No. 3 Sullivan, Section Block 7, is drilling at 4,055 feet casing set at 4,036 feet; No. 2 Chit Section 158, Block 7, is fishing at 7 feet.

Medina County

California-Medina's No. 1 Rothe, S vey 1,012, is at 3,278 feet on bottom, ing milled through bailer. Carl G. C well's No. 1 Taylor, Section 135, B 28, is shut down at 350 feet. Don son Oil Development Co.'s No. 1 Ad Joseph Hillemeyer Survey No. 25, i cation 160 feet to east line and 1,227 to south line. Holt & Cromwell's N Mott, Survey 1,267, is location 2,250 to east line and 4,182 feet to south l No. 1 Henry Batot is shut down at feet. Milton & Webster's No. 1 C tree, 1 mile west of Hondo, is dri in. North & South Development No. 1 Charles Nehr, Survey 441, D. Burnett, 150 feet to south line and 7 feet to east line, at 844 feet is in of the Eagleford, log seem to be run little high, showing heavy oil at 4 200 feet.

Refugio County

Dunlap & Wilkinson's No. 1 Roo mile north of Arkansas River, 700 west of railroad, is standing at 2 feet. J. M. Davis and Tom Horn's 1 Howard, Section 8, located 600 to north line and 2,640 feet to east

is standing at 417 feet after setting and cementing surface casing.

Nueces County

Nueces River Basin Development Co.'s No. 1 F. C. Allen, G. Farrier Survey, 1,596 feet to south line and 474 feet to west line, has sand at 2,717-25 feet and will set casing to test.

San Patricio County

George B. Pickett's No. 1 Whitworth, NW NW, Section 60, at 3,250 feet has resumed drilling after mudding off gas showing at 3,150 feet. F. P. Zoch's No. 1 F. C. Andrews, Block 7, Welder & Odem Subdivision, 200 feet to north and west lines, is drilling at 3,200 feet.

Uvalde County

Pure Oil Co.'s No. 1 J. D. Smythe, Survey 687, located 740 feet north and 146 feet east of SE cor. of Survey 20, at 4,810 feet total depth, will shoot in a few days with 60 quarts at 2,378 feet in Edwards.

Victoria County

Houston Oil Co.'s No. 2 McFaddin, J. G. Smalley Survey, is location in northwest corner.

CALIFORNIA FIELDS

(Continued from Page 64)

in Section 26-32-23, and this project, which will be an offset to the Union Oil Co.'s No. 1 Western Petroleum in Section 27-32-23, will undoubtedly be spudded in within two weeks. Drilling operations in the Fruitvale Field of Kern County, a few miles west of Bakersfield, are slowly but consistently increasing, and if this field comes up to expectations, several satisfactory producers will be finished during the next several months. The Standard's deep test in the Elk Hills Field of Kern County has just passed the 5,400-foot level, and while it has only received passing attention, it may ultimately prove a very important well. The Standard undoubtedly anticipates the necessity of exceedingly deep drilling, as very large surface pipe has been used. The possibility of developing deeper production in the Elk Hills Field is exceptionally bright, especially since the Standard lost a deep well due to a terrific gas blowout about a year or two ago.

LOUISIANA-ARKANSAS

(Continued from Page 57)

bbls. from their last week's average and Arkansas an increase of only 200. Daily average runs from the several pools were:

Louisiana	
Caddo light	9,475
Caddo heavy	2,930
Homer	4,100
Haynesville	5,800
DeSoto-Red River	4,085
Elm Grove	600
Bellevue	920
Cotton Valley light	570
Cotton Valley heavy	3,520
Urania	6,220
Pleasant Hill	535
Total	38,755
Arkansas	
El Dorado	5,000
Smackover light	7,180
Smackover heavy	54,050
Stephens	1,010
Nevada County	1,400
Lisbon	1,710
Champagnolle	12,930
Bradley	100
Total	83,380
Both states	122,135
Last week	122,595
Decrease	460

North Louisiana

Bossier Parish

Elm Grove and Sligo—Barrett & Morgan's No. 1 Jones, Section 16-17-11, is in chalk rock at 1,890 feet. Palmer Corp. set 10-inch surface pipe at 203 feet on No. 11-B Hodges, Section 25-16-12.

Caddo Parish

Mooringsport—Falcon Oil Co. has made location for No. 3 Muslow, 1,120 feet west and 200 feet south NE cor., Section 29-20-15.

Oil City—L. M. Emlet is installing air jammer on No. 9 Glassell in Section 10-20-15, total depth 2,240 feet. Magnolia Petroleum Co. cemented 8¼-inch casing at 3,004 feet on No. 3 Levee Board, Section 7-20-15, total depth 3,012 feet. H. M. Mattson is bailing to test No. 1 Boisseau, Section 34-21-16, total depth 2,290 feet.

Pine Island—Dixie Oil Co. is cleaning out No. 92 Dillon, Section 13-21-15, preparatory to running 4½-inch casing to test a gas show in 5 feet of lime and shell, total depth 6,099 feet. Magnolia Petroleum Co.'s No. 18 Robertshaw, Section 24-21-15, is drilling lime at 3,320 feet; No. 23 Robertshaw, Section 23-21-15, is in lime at 2,725 feet.

Claiborne Parish

Haynesville—Smitherman & McDonald are reaming No. 1 Miller, Section 17-23-8, to set 9¼-inch casing at 3,600 feet.

LaSalle Parish

Urania—Ayers Brothers set 10-inch at 102 feet on No. 6 Tremont, Section 30-10-2e, and are drilling at 1,350 feet. Randall and others' No. 1 Urania in Section 12-10-1e, is shut down for orders, total depth 700 feet.

Monroe District

Morehouse—Natural Gas Producing Co. cemented 6-inch casing at 2,075 feet on No. 1 fee, Section 9-20-4, and has location for No. 13 Tensas, 1,320 feet north and 2 feet west SE cor., Section 34-22-4. Southern Carbon Co.'s No. 7 Tensas, Section 15-22-4, is drilling at 1,475 feet. Stovall Drilling Co. cemented 8-inch at 878 feet on No. 1 Etheridge, Section 22-20-4. United Carbon Co.'s No. 1 Wright, Section 10-20-4, is drilling at 1,525 feet.

Ouachita Parish—Arkansas Natural Gas Corp. cemented 8-inch at 917 feet on No. 1 Potts, Section 30-19-4, and is drilling at 1,415 feet. Jordan Drilling Co. is arranging to test No. 1 Cole, Section 1-18-3, at 2,193 feet. G. E. Jordan is fishing for drill stem in No. 1 Wall, Section 12-18-3, total depth 3,218 feet. Magnolia Petroleum Co.'s No. 3 Millsaps, Section 36-20-4, set 15½-inch surface string at 278 feet and 10¾-inch at 875 feet. Pipes & Mack have rig up for No. 1 Wright, 495 feet west and 1,617 feet north SE cor. SW, Section 11-18-4, and for No. 2 Wright, 495 feet west and 541 feet north SE cor. SW, same section. Union Consumers Gas & Producing Co. is drilling No. 2 Slaughter, Section 24-19-4, at 1,050 feet. West Virginia Oil & Gas Co. has made location 660 feet south and west NE cor. SE, Section 6-18-4, for No. 6 fee.

Union Parish—Moody & Seagraves' No. 1 Dawkins, Section 17-20-4, is drilling at 1,920 feet.

Red River Parish

Bull Bayou—Odell & Lawton set 10-inch casing at 100 feet on No. 4 Richardson, Section 25-13-11, and 6⅝-inch at 2,495 feet.

Richland Parish

Magnolia Petroleum Co.'s No. 1 McCoy, Section 29-16-6, is drilling at 1,924 feet; No. 2 J. Sartor is a derrick 660 feet north and east of SW cor., Section 16-16-6. Richland Producing Co. has rig up for No. 1 D. Sartor, 1,410 feet north and 693 feet west SE cor., Section 32-16-6.

Webster Parish

Cotton Valley—Magnolia Petroleum Co. has made location 660 feet south and west NE cor. NE SE, Section 23-21-10, for No. 4 I. Cox. Ohio Oil Co.'s No. 42 Bodcaw, Section 27-21-10, is drilling lime at 3,626 feet. Palmer Corp.'s No. 4 Tillman, previously reported as No. 2, in Section 28-21-10, is in sand rock at 3,115 feet. Superior Oil Co. is drilling lime at 4,295 feet on No. 1 McCook & Hibbler, Section 21-21-10.

Sarepta and Shongaloo—Virgil Helm's No. 1 Martin, Section 7-22-9, is drilling lime at 2,615 feet. Magnolia Petroleum Co. cemented 2,582 feet of 6⅝-inch casing on No. 1 Bond, Section 5-22-9, and has rig up for No. 1 M. M. Branton in the same section; No. 1 Lewis, Section 25-23-10, is drilling shale at 3,213 feet; No. 1 Scroggins, Section 1-22-11, set 13⅜-inch pipe for surface string at 295 feet and is drilling at 1,170 feet.

Arkansas

Nevada County

Humble Oil & Refining Co.'s No. 1 J. Haynie, Section 6-14-20, set 64 feet of 10-inch casing and is drilling at 825 feet; No. 2 Hein, Section 1-14-21, is drilling at 250 feet.

Union County

Champagnolle—H. L. Hunt is coring No. 3 Gregory in Section 10-17-14, at 3,029 feet. E. M. Jones cemented 6⅝-inch casing at 3,145 feet on No. 1 Sample, Section 7-17-13, total depth 2,196 feet. Lion Oil Refining Co.'s No. 3 Nash, Section 6-17-13, is drilling at 2,901 feet. No. 4 Union Sawmill, Section 7-17-13, had 500 feet of oil in the hole from 11 feet of sand, total depth 3,089 feet and pulled liner to run core barrel. Magna Production Co.'s No. 1 El Dorado Realty Co., Section 7-17-13, is drilling at 2,900 feet. Magnolia Petroleum Co. tested 2,000,000 feet of gas at 3,220-26 feet and is setting 6⅝-inch casing at 3,220 feet for a test on No. 2 Dumas, Section 11-17-14, total depth 3,227 feet; No. 2 Gregory in Section 15-17-14, set 15½-inch casing at 365 feet. Marine Oil Co. has derrick up for No. 4 Sample, 330 feet north and west SE cor. NE NW, Section 7-17-13. C. E. Murdock set 10-inch casing at 183 feet on No. 2 Union Sawmill, Section 6-17-13, and is drilling at 500 feet. Ohio Oil Co. has derrick up for No. 1 Alphin, 330 feet north and 200 feet west SE cor. NW NW, Section 7-17-13; No. 1 Frazier, Section 6-17-13, is drilling at 2,509 feet; No. 2 Nash, Account 1, Section 6-17-13, cemented 6⅝-inch at 3,020 feet, total depth 3,027 feet; No. 1 Nash, Account 2, in the same section, cemented 6⅝-inch at 3,120 feet, total depth 3,022 feet, and No. 3 Nash, Account 1, also in Section 6-17-13, is drilling at 1,832 feet. Oilwell Corp. has derrick up for No. 2-A Kelly, 150 feet east and 330 feet south NW cor. NE NW SE, Section 9-17-14. J. W. Olvey is coring No. 1 Sample, Section 7-17-13, at 3,257 feet. Skelly Oil Co. is drilling No. 1 Kelly, Section 9-17-14, with 12½-inch set at 140 feet.

EAST TEXAS

Harrison County

McRitchie and others' No. 1 Baldwin, E. Fuller Survey, is shut down at 2,180 feet.

Panola County

S. E. Davidson and others' No. 1 Johns, in the W. H. Wooley Survey, is shut down for orders at 1,950 feet. Eureka Natural Gas Co. is drilling at 200 feet on No. 1 Becknell in the Elijah Williams Survey. Magnolia Petroleum Co.'s No. 2 Lula Fletcher in the B. C. Jordan Survey is drilling lime at 2,477 feet; No. 2 Steele, in the same survey, blew out at 3,259 feet with an estimated 25,000,000 feet of gas which they are trying to kill to set casing. Natural Gas Products Co.'s No. 2 Moore, in the B. C. Jordan Survey, is drilling at 2,400 feet. D. Thomason killed a blowout that wrecked the derrick of No. 11 Crenshaw in the B. C. Jordan Survey and cemented 6-inch at 2,460 feet. C. W. White cemented 6-inch casing at 2,290 feet on No. 1 Robinson in the James Matthews Survey and is drilling at 2,606 feet.

WELL BACK PRESSURE AND FLUID LEVELS

(Continued from Page 50)

standing. It has been customary to consider the pressure held on the trap, or the pressure held on the tubing just back of the flow nipple as a back pressure. If a well were flowing through the casing, and if it were pinched in by a valve or flow nipple as at K, in Figure A, there would be a back pressure considered as at the point K, but there would be no way in which the back pressure at the point "f" at the bottom of the well, could be determined. If, however, the well were tubed, as in Figure D, and the flow pinched at J, we could determine the back pressure as at the point J, and by having a pressure gauge at K, the pressure at the point K could also be determined which would be fairly close to the pressure at the lower end of the tubing, taking into account, of course, the weight of the static column of gas between the casing and the flow tubing. By varying the pressure at J, there will be caused a variation of the pressure at the lower end of the tubing which will be noted on the gauge at K. In Figure D, if the tubing were suspended with the lower end very close to the point "f," assuming the production conditions of the well to be similar to those previously discussed, the pressure shown on the gauge at K would be 78.12 pounds if the well be flowed at the rate of 500 bbls. per day. The back pressure at "f" would then be 78.12 pounds though the gauge at J, just under the flow nipple, might register 5 pounds or 10 pounds or some other figure. The importance of the back pressure at J does not depend on this pressure of itself, but on the effect it causes in the well at "f." In other words, the place where back pressure possesses a significance is at "f," and pressures at J, no matter how brought about, are of no consequence except as they influence the pressure at "f." If the well in Figure D produces 500 bbls. per day, the pressure at "f" will be 78.12 pounds whether the well be flowed naturally, by gas lift, pump, swab or bailer, or whether the back pressure at the top be 5 or 10 pounds, assuming that the production is a steady one. The statement is sometimes made that the gas lift sets up a back pressure on the sand. This is true to the extent that it is true of any other method of producing oil, in that if the well in Figure D is produced at the rate of 500 bbls. per day the back pressure on the sand will be 78.12 pounds. If the well be produced at 1,100 bbls. per day there would be a back pressure of 19.53 pounds, remaining on the sand whether it be produced by gas lift, natural flow, pump or other means.

Methods of Production

If large production be desired, the question resolves itself into one of determining the method that can be employed to reduce the back pressure at "f" to that which will furnish the required production, assuming, of course, that the well is capable of making this desired production. If it be desired to lift 1,100 bbls. per day and if there be sufficient gas with the oil to lift this 1,100 bbls. per day, it can be flowed naturally provided the proper size of tubing be employed. If there be insufficient gas to flow this quantity, there must be additional gas admitted to lift the required quantity, provided it be desired to employ a flowing method. Swabbing might lift 1,100 bbls. per day, and in exceptionally favorable cases the production might be lifted by the beam pump if the well be comparatively shallow. But the back pressure at "f" will remain at 19.53 pounds whatever be the means that succeeds in lifting 1,100 bbls. per day.

If the wells be shallow the method employed will usually be determined by the operating cost and by the expenditure required for the equipment. If the wells be very deep, say, 6,000 to 7,000 feet, and if there be insufficient gas to flow 1,100 bbls. per day it may be necessary to employ the gas lift because of it being almost impossible to lift this quantity by means of the pump, bailer or swab. Wells ranging between shallow depth and great depths can be produced by the means that serves the purpose better as respects operating costs and initial expense of equipping the well.

This back pressure at "f" is influenced by the diameter and length of flow-tubing and of the gas line with which the well is equipped. If the diameter of the casing is sufficiently large, say 8 to 10 inches, almost any production usually found to obtain can be lifted, if a gas line of a sufficient diameter be suspended in the well to carry the required quantity of gas to the bottom of the well; the well would then be flowed between the casing and the tubing. The pressure shown on the gauge on the gas line, as at I in Figure C, might be very high, and yet the pressure at the lower end of the tubing might be low; the gauge pressure at I, as mentioned before, is not a close guide for estimating the back pressure at the bottom of the well. If in a well of 2,000 feet in depth, the casing be 10 inches, and the oil that can be produced is only 200 bbls. it would be

very expensive to attempt to lift the oil between the casing and the tubing; it would be necessary to equip such a well with a flow tubing of the proper diameter as in Figure D, and produce the oil through the tubing. The diameter of the tubing would be determined by the quantity of oil to be lifted. Tapered tubing would be more economical in consumption of gas than a straight tubing under most conditions. Here again, the back pressure left on the sand while producing the well would depend directly on the rate at which the well is produced.

In very old wells the rock pressure may have declined to so low a point that almost no submergence could be obtained for use with the gas lift. The writer has lifted water 1,075 feet at the rate of 500 bbls. per day with a submergence of only 6 feet, but the consumption of air was very great and could hardly be recommended in any case. In such a case of very low pressure, unless a pocket can be made in the bottom of the well, and the well be "blown" out periodically by "stop-cocking," it would probably be advisable to lift the oil by means of the pump than to use the gas lift.

Friction Losses

Friction losses may become very great especially if the discharge end pressure be low when flowing large quantities of gas through a small tubing. The pressure required to force 700 cubic feet of air per minute through 4,000 feet of 2½-inch pipe, where the discharge pressure is 2 pounds, is 90 pounds at the input end. If, then, a well be equipped with a flow tubing of 2½-inch diameter, and the rock pressure be 50 pounds and we attempt to force 700 cubic feet of air per minute through this line and discharge it at the surface at 2 pounds the pressure at the input end would be 90 pounds which is 40 pounds higher than the rock pressure. There would be no flow of oil whatsoever at the discharge end, in fact there would be a serious loss of air since part of the air would flow back into the sand and only a part of it would issue from the discharge end of the tubing. The writer has carried out tests at several wells equipped with small tubing where, during the course of the experiment, sufficient gas was admitted to cause a normal flow of 200 to 300 bbls. per day to cease entirely.

Every well has a fluid level at which it is most efficient to produce the well both for oil and for gas; this point may, or may not, be the maximum rate at which it is possible to produce the well. When a well is producing through a tubing of a given diameter, either by natural flow or by air lift, there is a production rate beyond which it is impossible to go with that particular diameter of tubing. This rate beyond which it is impossible to go may not be the economical rate at which the well could or should be produced. Care should be taken to determine which of these rates has been reached, since the use of tubing of too small a diameter might reduce the efficient rate at which the well should be produced and yet this fact could easily remain unknown. So far as the observations of the writer extends, the efficient rate at which to produce wells in the Seminole Field, as judged from gas-oil ratio standpoint, is close to the maximum rate at which the oil can be produced.

The theory has been advanced that a pumping well can operate with a gas-oil ratio that is less than that of a well flowing by natural means or by use of the gas lift, on the basis that no gas is required to lift the oil in a pumping well. Actual comparisons on wells employing gas lifts followed by beam pumps have shown no appreciable difference in the gas-oil ratio when the well is being operated at the same capacity whether it be on the pump or on the gas lift. This is a logical result since the production of a given quantity of oil whether by gas lift or by the pump will maintain the same liquid level, and the flow of oil and gas from the sand into the well is controlled by the liquid level rather than by the means employed in lifting the oil. The quantity of gas required to propel the oil through the sand into the well must be allowed to issue from the well, else the oil will not flow into the well.

It is desirable, of course, to control and to ascertain the liquid level at which the oil and gas will flow into the well in the most efficient manner, and to accomplish this purpose some engineers raise or lower the tubing string. In fields where the writer has so far had experience in this work he prefers to change the fluid level by control of the rate at which the well is produced rather than by changing the length of tubing. This method requires the use of proper diameters of the pipe, and the use of tapered tubing in order to obtain the best efficiencies.

CANADIAN FIELDS

(Continued from Page 59)

around 4,980 feet. The diamond drill outfit from Spooner's No. 1 is being rigged up on Vulcan Oils' No. 1 producer, LSD 11, Section 13-20-3w5. The latter, which has been frozen most of the time at 5,004 feet in the deep lime, will be cleaned out and brought back into production.

Turner Valley Production

Figures of Turner Valley production for October show a further decline from the September totals. The total October production amounted to 31,840 bbls., compared with 39,014 bbls. in September. Royalite Oil Co.'s No. 4 even showed a decline, with 14,032 bbls. as against 16,143 bbls. in the previous month. Fluctuations in production are apparently due to freezing of some of the newer producers, though this would not affect Royalite's No. 4, which has been a steady and consistent producer. McLeod Oil Co.'s wells did considerably better than in September, while on the other hand the Royalite Oil Co.'s No. 6, which normally has been good for around 200 bbls. a day, was frozen and delivered nothing to the line, and Royalite's No. 8, which has averaged as high as 250 bbls. a day, produced only 1,654 bbls. for a month, this decline being also due to freezing. Dalhousie Oil Co.'s No. 1, with a large potential production, close to 200 bbls. a day, was also frozen most of the time, and delivered only 135 bbls. for October. Illinois-Alberta Oils' No. 1 maintained a steady average of 80 bbls. a day; while Spooner Oils' No. 1, which came in late in October, made a daily average of 44 bbls., but toward the close of October was up to 60 bbls. a day. Figures of individual wells delivering to Imperial Oil, Ltd., are as follows:

Crude Naphtha Producers	Aggregate for month	Daily average
Royalite's No. 4	14,032	452
Royalite's No. 6	.....	...
Royalite's No. 7	2,673	86
Royalite's No. 8	1,654	53
Dalhousie's No. 1	135	4
Illinois-Alberta's No. 1	2,489	80
McLeod Oil Co.'s wells	609	19
Total	21,592	
Light Crude Producers		
Royalite's No. 9	179	5
Royalite's No. 10	103	3
Royalite's No. 11	127	4
Royalite's No. 15	384	12
Dalhousie's No. 5	1,728	55
Dalhousie's No. 6	424	13
Home's No. 1	114	3
Home's No. 2	1,834	59
Foothills' No. 1	353	11
Foothills' No. 2	129	4
McLeod's Nos. 1 and 4	2,748	88
Okalta's No. 2	69	2
Total	8,192	

Total deliveries to Imperial Oil, Ltd., reached 29,784 bbls. In the same period Regal Oil Refineries, Ltd., took the following production, all light crude oil:

Well—	Aggregate for month	Daily average
Spooner Oils' No. 1	1,363	44
New McDougall-Segur Co.	693	22
Total	2,056	

McLeod Operations

McLeod Oil Co.'s No. 3, LSD 16, Section 1-20-3w5, is drilling 40 feet in the deep lime at 4,700 feet, and should be in production within a few weeks. McLeod's No. 5 has been located 200 feet north of the south boundary of the N half of LSD 16, same section, and 200 feet west of the east boundary, being southwest of No. 1 and southeast of No. 3. Cellar is being dug. As soon as No. 3 is finished, the outfit will be used to clean out No. 2 producer, after which No. 5 will spud in.

New McDougall-Segur Oil Co.'s No. 2, LSD 14, Section 12-20-3w5, is 15 feet in the Home sand at 4,194 feet with a gas flow of 1,500 feet a day, and is running 8¼-inch casing. Drilling will be continued to the deep lime.

In the north end of the Turner Valley Field, Freehold Oil Corp., SW Section 3-21-3w5, is drilling around 2,280 feet, after encountering a wet-gas flow measured at 2,700,000 feet a day.

Seneca Oil Co.'s No. 1, LSD 1, Section 34-20-3w5, is at 4,935 feet and drilling in the top of the second McDougall-Segur sand, with a small gas flow.

British Dominion Oil Development Corp.'s No. 2, LSD 6, Section 12-20-3w5, is drilling at 2,380 feet near the top of the Dakota formation. In view of its location, surrounded by Dakota producers, the test is expected to get production in the McDougall-Segur sand between 2,600 and 3,000 feet.

Model Oils, LSD 8, Section 22-20-3w5, has resumed drilling after cementing 12½-casing in the top of the Dakota at 2,543 feet. The test, which was spudded in August 16, has been running three shifts, and is expected to get the deep lime in another 1,800 feet. Chris Bennetsen is in charge of operations.

Gas Storage

Considerable interest is felt by Turner Valley operators in the two projects for storing the surplus gas from the field. One of the tests is being undertaken by the Canadian Western Natural Gas, Light, Heat & Power Co. of Calgary, which will pump the gas into the exhausted sands of the old Bow Island Field. The Canadian Western company will build its first unit to be ready in the spring. This unit will consist of a 165-horsepower twin gas engine and compressor to be installed at a cost of $35,000. A pressure of 750 pounds will be required to overcome the rock pressure. It is expected this unit will handle 5,000,000 feet a day for about 150 days in the year; and the plan provides for ultimately storing 20,000,000,000 feet of gas in the Bow Island Field.

The second project is being undertaken by the Royalite Oil Co., which is drilling its No. 22 well for storage purposes. This hole will be drilled to the Dakota-Blairmore horizon, and the residual dry gas, after the crude naphtha has been extracted by the separators, will be forced down into the McDougall-Segur sand.

In the Highwood district, south of the Turner Valley Field, Imperial Oil's Highwood No. 1, LSD 3, Section 36-18-3w5, has resumed drilling. This test was for some months shut down at 3,624 feet on account of a crooked hole. A diamond-drill outfit brought from Peru has been rigged up, and is now drilling out cement at 3,596 feet. The structure here is somewhat similar to the Turner Valley, and the well is apparently in the Fernie shale horizon, just above the Dalhousie sand, where light crude is found in the Turner Valley. The test will, if possible, be carried to the deep lime horizon.

In the Border fields, Madison Oils' test on the Beaver Dome, LSD 10, Section 24-2-11w4, has a small gas flow, estimated 100,000 feet a day, at 625 feet, after drilling through considerable sticky shale in the Bentons. A gas flow was looked for in the lower Bentons between 700 and 900 feet, but apparently the well is higher on structure than was anticipated. The log on the old Beaver well also indicates a possibility of gas and oil in a lower sand between 1,400 and 1,500 feet. In Chin Coulee district, Lethalta Oils, LSD 5, Section 33-8-18w4, is drilling considerably below 2,100 feet, after encountering several shows of gas.

In the Milk River district, Capitol Oil & Gas Co., drilling on the Dowling structure in LSD 4, Section 4-2-12w4, reported a fair show of gas at 550 feet. Some gas was also encountered at 250 feet. The 20-inch was used to shut off quicksands, and the 15½-inch to shut off surface water at 200 feet. More gas is looked for around 900 feet, and the company expects to get the Sunburst sand at 1,800 feet by the end of November, though the estimated production level is in the Ellis at 2,600 feet. It is planned to carry an open hole at 800 feet, and then set the 12½-inch. The Capitol well is testing a stretch of 1,760 acres on the crest of the Dowling structure, while the company holds additional acreage on the Beaver Dome, and in other Alberta fields. The Capitol company is backed largely by Vancouver, B. C., men, the officers including: President, J. H. Bricker; general manager, C. D. McRae; directors, Reginald Beaumont, George S. Gamble, R. H. Wright, A. S. Lock, James A. Campbell. Commonwealth Oil Co. of Calgary is continuing its structure tests east of Milk River.

West of Coutts, Ko-Top Oils, Ltd., of Calgary has a block of 470 acres on the Red Coulee structure, and will drill in Section 2-1-17w4, 7 miles west of Coutts, and 1½ miles of the Imperial- Red Coulee well, abandoned some years ago owing to water troubles after striking a fair show of oil. Ko-Top Oils is financed largely by farmers and business men of Queenstown and Milo, the officers including: President and managing director, W. J. Douglas, Calgary; vice president, Steve Williams, Queenstown; director, John Winkler, Milo. No. 1 test will spud in about December 15.

Northern Alberta

In northern Alberta, the test of Peter and Paul Von Weymarn, Section 21-89-3w4, on the Clearwater River, is reported shut down for the winter at 500 feet. The test started drilling last summer in the Devonian limestone, and at 340 feet got a small show of oil. The porous strata is expected to continue to about 800 feet. Drilling on No. 1 will be resumed in the spring, when Von Weymarn Brothers will start three additional tests, one on the Clearwater River and two in other portions of the Athabaska district. Paul Von Weymarn, who spent the summer in the field, has returned to Norway. A. M. Slack is field superintendent.

Meridian Oils' No. 1, LSD 1, Section 16-45-1w4, which got a big gas flow at 1,820 feet in an horizon corresponding to the Viking sand, will probably be drilled deeper for oil. A water shut off will be made just above the gas sand, and casing cemented. It is thought an oil sand may be encountered around 1,920 feet, approximating the depth at which Imperial Oil's No. 1 Ribstone secured its oil show. The Imperial-Ribstone show was between 1,870 and 1,900 feet and the Meridian well is slightly deeper. The gas flow in the Meridian started at 30,000,000 feet a day, and after blowing open 15 hours tested 27,500,000 feet. The rock pressure is around 900 pounds. Analysis shows the gas to be a dry gas similar to that in the Viking Field, with no sulphur content. Salt water was met at 1,670 feet and a temporary shutoff made by resting the 8¼-inch on a sandstone ledge. This broke loose when the well blew in, and a permanent shutoff is now being made. In the same field, Ribstone Oils' No. 2, LSD 5, Section 2-47-1w4, is reported drilling at 920 feet.

In the Wainwright Field, east central Alberta, Maple Leaf Oil & Gas Co. is working on derrick for its No. 2, LSD 1, Section 24-45-8w4, 600 yards due north of No. 1 gasser. No. 1 is supplying gas to the town of Wainwright and the Canadian National Railways. No. 2 is being drilled as a gas reserve well, and will spud in this fall. Reports that the federal government had granted leases on the Wainwright National Park area are officially denied by Hon. Charles Stewart, minister of the interior, who states that numerous applications for oil leases on this area have all been turned down, the government taking the view that there is plenty of other acreage open.

Saskatchewan

In Saskatchewan, Rosetown Oil & Development Co.'s No. 1 Herschel, LSD 11, Section 4-31-17w4, is at 2,034 feet, after passing through a sand with fair showings of oil and gas. The oil was struck in the top of the Dakota, and the sand

has not been completely drilled through. It is thought the well may prove a fair commercial producer, and a production test is being made before it is drilled deeper. In the Simpson district, Simpson Oil & Gas Co.'s No. 1, Section 9-29-25w2, is drilling below 1,800 feet, with 6-inch casing carried down behind the drill. A small gas show has been struck around this depth.

In the Unity Valley district, Citizens Oil & Gas Co.'s Unity Valley No. 2, SE Section 23-41-24w3, is reported drilling around 2,850 feet, with oil looked for around 3,200 feet. This depth may be reached before the well shuts down for the winter.

Radium Well

In Ontario, a unique discovery is reported in connection with a wildcat test drilled by R. J. and E. Henderson on the John Ash farm, Lot 11, Concession 3, Vaughn Township. The location is near the little village of Maple, 14 miles north of Toronto. The test was started by the Henderson syndicate in 1922, location being made by means of an electrical oil-finding device. The Hendersons continued drilling until November, 1924, when Sir Donald Mann secured an option on the well and leases at $600,000 and took over the operations. Later the test ran into a difficult job, the option was surrendered, and the well reverted to the Hendersons. They cleaned up the fishing job and continued the drilling till a depth of approximately 4,300 feet was reached, when water was struck, the flow, however, amounting to only 36 bbls. a day. The water had such strong mineral qualities that it was undrinkable, and when the first analysis showed 18 per cent of chloride, including 9½ per cent of sodium chloride and 5 per cent of magnesium chloride, a further sample was sent to McGill Laboratories for more careful testing. The second analysis showed a quantitative assay of radium, three parts of radium to every quadrillion parts of water. It is stated that only two other wells in the world, both in Europe, possess radium, in neither case sufficiently strong to yield a quantitative assay. The radium water in the Henderson well has valuable medicinal properties, and the owners are planning distribution through the medical profession, after turning down two offers from the property.

CAUSES AND EFFECTS OF CROOKED HOLES

(Continued from Page 51)

the pay even though it is crooked. He only has to worry about it while it is being drilled, which is nothing compared to the operator's trouble in the future, especially after the well is put on the pump. It is up to the producers to take into consideration just what effect upon his ultimate recovery as to economic operations of his property, that this hurry up policy will cause.

Effects

In the running of the smaller sizes of casing, especially the "oil string," crooked holes throw added stress to the casing which in many cases is greater than its construction will stand. This brings about parted or collapsed pipe. Also, they have an inflence on the running of liners. In some instances it is impossible to run them due to the turns encountered being too great to allow the liner to be lowered, even though it is done in sections.

In practically all fields at some time in the life of the well, swabbing is resorted to as a means of operation. This method of operation when undertaken and carried on for any length of time in a crooked hole results in a wire line cut oil string, which may be of such extent that it reduces the resistance of the casing replacement. Frequently, it will cause expensive operation due to the replacement of casing cut swab rubbers. To the writer's knowledge, in several instances this one item reached an amount of $100 per day on leases operated in the Mid-Continent area.

When production reaches the point where it is necessary to install tubing and rods then the most notable effects of crooked holes are shown. It is a well-known fact that there are a number of wells in the Seminole area alone that have been abandoned even though they were producing nearly 100 bbls. per day, simply because it was not economically possible to operate them due to broken rods, rod-cut tubing and casing-cut tubing couplings, not so much from the replacement and labor charge as from the loss of producing while repairs were being made.

The added friction imposed by crooked holes on pumping equipment necessarily means more power for operation which is reflected on the operation expense.

Premature Explosions

There are instances where holes have been junked after they were in the pay and on production, due to premature explosions of nitroglycerin which are traceable to crooked holes. These explosions may be caused in the following manner: In lowering the shell, friction generating sufficient heat to cause the nitroglycerin to expand enough to slop over the shell; when this occurs we all know the result is simply another junk hole or a bad fishing job.

The writer was unable to obtain from any source the operating costs on "Crooked Hole Operation vs. Straight Hole Operation." It is believed if such a survey were carried out, it would probably show some very interesting results.

The effect of crooked holes on correlation of data for a geologic purpose are so well known that it is not necessary to take up their discussion here.

As stated at the beginning, this paper is not offered with an idea of pointing out all causes and results of crooked holes, but is offered as a basis for discussion which may bring out some means of eliminating some of the causes, thereby reducing the results from crooked holes.

The writer would like to suggest that a committee be appointed from this district, composed of like members from the producing and drilling divisions, to assemble, collate and consider data on the bearing crooked holes has on the economic operation of producing properties, and also to device means for their elimination as far as possible.

KANSAS FIELDS

(Continued from Page 54)

son, C NE SE, Section 30-18-2w, has been abandoned at 3,664 feet.

Rooks County

The Prairie Oil & Gas Co. made location for No. 1 Sandberg, C SW Section 20-9-18w. Vickers Petroleum Co.'s No. 1 Lukeman, SW cor. SE, Section 11-9-16w, made 35 bbls. from sand at 3,289-90 feet. Keys Petroleum Co.'s No. 1 Rothburn, NE cor. SW, Section 14-9-16w, is dry and abandoned at 3,340 feet. Phillips Petroleum Co.'s No. 1 Overholser. C SE, Section 30-9-16w, is a dry hole at 3,665 feet.

Reno County

Austin Drilling Co. has the rig on the ground for No. 1 Stuckey, SW cor. NW, Section 17-26-5w.

Seward County

Ben S. Ash and others' No. 1 Son, NE cor. Section 14-33-33w, is dry and abandoned at 5,036 feet.

Sumner County

McDonald and others have the cellar dug for No. 2 Buffington, SE cor. SW NW, Section 14-32-2. Cameron and others' No. 1 Shepherd, SE cor. NW, Section 1-32-2, has been abandoned at 2,655 feet.

GULF COAST FIELDS

(Continued from Page 59)

sandy shale and lime at 300 feet. No. 1 Dew is drilling sand, shale and lime at 2,363 feet. No. 1 Nelson is drilling sticky shale at 2,255 feet.

Barbers Hill—Chambers County

Bennett Petroleum Co.'s No. 2 Kirby is drilling gumbo and lime at 2,345 feet. The same company's No. 2 Smith is rigging up. Humphreys Corp.'s No. 1 Higgins is waiting for cement to set to test a shallow sand 504-25 feet. This company's No. 1-C Kirby is in gumbo and lime at 2,308 feet. Its No. 3-A Barbers is in lime and gumbo at 2,320 feet. No. 1 Cornelia Barber is rigged up, and No. 6-B Kirby is a derrick. Joe Bashara's No. 1 Tarbutton has been spudded in. On the southwest side of the "hill," Yount Lee Oil Co.'s No. 1 Chambers County is down 1,961 feet in gumbo where 10¾-inch casing has been cemented. No. 1 Richardson is drilling sand at 919 feet.

Boling—Fort Bend and Wharton

Gulf Production Co.'s No. 2 E. C. Farmer is drilling hard sand at 3,241 feet. Heep & Hawn's No. 1 River Bed has resumed drilling after being shut down at 162 feet because of high water. Sun Oil Co.'s No. 5 E. C. Farmer is drilling sandy shale at 3,471 feet. Vacuum Oil Co. has made location for No. 1 Kasparek to offset Sun Oil Co.'s No. 1 Rogers completed several months ago as a small producer and which still is pumping around 75 bbls.

The Texas Company's No. 12-A Taylor on the southwest is drilling shale and lime at 3,807 feet. This company's No. 2-B Taylor is drilling sticky shale at 3,-130 feet. Sinclair Oil & Gas Co.'s No. 4 Taylor and Atlantic is being rigged up to pump. This is an old well deepened 3 feet to 2,945 feet.

Blue Ridge—Fort Bend County

Blue Ridge drilling operations at present are at very low ebb. J. S. Abercrombie's No. 4 West-Schenck, south side, is drilling sidetracked hole at 3,165 feet. Humphreys Corp. is rigging up to deepen its No. 3 West-Schenck. Gulf Production Co. has spudded its No. 16-B Blakely and has a rig up to deepen its No. 5 Invincible.

Navarro Oil Co.'s No. 7-A Robinson, northwest side, is drilling gumbo at 682 feet. Blakely & Means' No. 1 Blakely, an old well being deepened, is drilling below 3,310 feet. Watts Oil Co.'s No. 3 Scott is drilling lime at 3,415 feet, and its No. 9 Blakely is in gumbo at 2,050 feet.

Big Creek—Fort Bend County

With the abandonment of its No. 2 Hausler, Navarro Oil Co. now is rigging up on its No. 2 Davis, having moved the rig over. Gulf Production Co. also is starting another test, its No. 50 Davis and is getting ready to deepen its No. 14 Davis. The Texas Company's No. 4 Wheat is down 524 feet in gumbo and has cemented 10-inch surface casing at 520 feet.

Nash—Fort Bend and Brazoria

Rycade Oil Corp. cleaned out its No. 13 Wisdom a former small producer, and Saturday was trying to bail it back in. Rycade and Humble Oil & Refining Co.'s No. 1 Wisdom is drilling shale at 3,865 feet. Rycade's No. 24 Wisdom is drilling at 3,992 feet.

Hardin County Domes

At Batson, East Batson is drilling another shallow test, No. 16 Stateland. Paraffine Oil Co.'s No. 79 Paraffine is drilling at 1,017 feet. Gulf Production Co.'s No. 20 Knight fee is being rigged up to pump. Rio Bravo Oil Co.'s No. 28 Teel, east flank of Saratoga, tested salt water Friday at 1,980 feet and Saturday screen was being pulled to deepen.

Goose Creek—Harris County

Humble Oil & Refining Co.'s No. 74 Simms-Smith, northeast of the Goose Creek Field, is drilling sand and shale at 5,019 feet. This company's No. 6 Hughes, which tested salt water at 1,-810 feet, is to be deepened. No. 10 Jones Stateland also is to be deepened. Gulf Production Co.'s No. 17-A Tabb is drilling below 2,841 feet, and its No. 12 Stateland Producers at 2,499 feet. Jim McMurry's No. 3 Grace Addey is drilling at 2,683 feet.

Pierce Junction—Harris County

Moody Corp.'s No. 1-A Whitehead, an old well deepened to 5,419 feet, swabbed down 4,000 feet making salt water with no trace of oil. This company's No. 3-B Whitehead is drilling rock at 4,016 feet, and a derrick is standing for No. 2 Boyles. This company's wildcat, No. 4-B Settegast, on the south flank, has been spudded.

Rio Bravo Oil Co.'s No. 9 fee, west side, is drilling sandy shale at 5,455 feet. This company's No. 10-B Settegast is in lime rock at 3,164 feet. No. 11-A Settegast is in lime and gumbo at 3,589 feet. Shaw and associates' No. 2-C Fitzsimmons, on the north side, is drilling shale and lime at 3,748 feet.

Gulf Production Co. is starting drilling in its No. 7 Cain on the east side. Its No. 26 Taylor still is fishing stuck drill stem. Navarro Oil Co.-Texas Exploration Co.'s No. 11 Dooley is in rock at 4,411 feet. Navarro Oil Co.'s No. 3-A Cain is drilling gumbo at 1,185 feet.

Spindletop—Jefferson County

Gulf Production Co. so far has been unable to make a well at No. 17 Marrs McLean. It is swabbing at 5,050 feet. Unity Petroleum Co. is waiting for cement to set to test shallow sand at 875 feet in its No. 11 Gladys City.

Yount Lee Oil Co.'s No. 16 Gladys City is drilling shale and lime at 5,688 feet. No. 20 Gladys City is running tubing with screen set at 3,424 feet. No. 40 Gladys City is drilling sand at 5,169 feet. No. 70 Gladys City tested dry at 4,219 feet and probably will be deepened. No. 71 Gladys City is drilling shale and sand at 4,831 feet.

On the McFaddin lease, Yount Lee Oil Co.'s No. 10 is milling out at 961 feet to deepen. No. 31, another old well deepening, is coring sand at 5,632 feet. No. 56 has been rigged up to deepen. No. 85, a new test, is down 898 feet where surface casing has been set. No. 66 is at 852 feet and is reaming to set casing. No. 87 is drilling gumbo at 846 feet. This company's No. 6 fee is in sand at 3,906 feet. No. 12 fee is milling at 4,084 feet and No. 1 Davis is drilling shale and lime at 3,678 feet.

Hull—Liberty County

The Texas Company's No. 5 Hannah fee, an old well deepened to 3,607 feet, tested salt water and has been shut down waiting orders. Republic Production Co.'s No. 106 Dolbear is drilling at 2,352 feet. This company also is rigging up to deepen two more old wells, Nos. 96 and 102 Dolbear.

Humble Oil & Refining Co. has started drilling in No. 24 Guedry as has Gulf Production Co. in its No. 19 Scarborough. The latter two are the first new tests started at Hull in several months.

Gulf's No. 23 Phoenix, an old well deepening, is drilling at 3,034 feet. A rig also is up to deepen No. 50 Phoenix. Empire Gas & Fuel Co.'s No. 17 Barngrover is sidetracking at 3,435 feet.

Orange—Orange County

Humble Oil & Refining Co. is trying to pull screen to deepen No. 12 Winfree. Sun Oil Co.'s No. 6 Brown is drilling sand and shale at 5,548 feet. This company's No. 4 Gunstream is fishing at 3,965 feet. Supreme Oil Co. is rigged up to deepen its No. 1 Jackson.

High Island—Galveston County

Gulf Production Co. has spudded in on its No. 8 Smith. Marrs McLean's No. 11 Cade is drilling below 3,397 feet and its No. 12 Cade is down 3,917 feet.

South Louisiana

Lockport—Calcasieu Parish

Vacuum Oil Co. and Gulf Refining Co.'s No. 3 Miller still is trying to pull screen to deepen after testing salt water at 4,454 feet. No. 21 Miller tested salt water at 3,887 feet, and also is to be deepened. On the Miller lease, which is in the heart of the field, these operators already have derricks up for Nos. 22 and 23, the first "inside" tests to be started at Lockport in over a year.

These operators' No. 4-A Farquahar has set 4¾-inch casing at 4,435 feet to test a sandy shale showing oil. No. 1 Henshaw-Lemoin is drilling water sand at 3,544 feet. No. 6 Lock-Moore was abandoned as dry during the week after going to 6,250 feet. It was a wildcat over 1½ miles from production.

Evangeline—Acadia Parish

E. F. Simms' No. 1 Clemont, on the west side of the dome has been cleaned out and has 6⅝-inch casing cemented at 3,872 feet. This well flowed for a short time after being brought in during October. The No. 2 Clemont also has been cleaned out and casing cemented. No. 1 Jennings Oil Co. is drilling below 3,400 feet and No. 1 Grace

Vonschuler below 3,575 feet. Gulf Refining Co.'s No. 2 Leckelt is drilling at 4,584 feet. Cranfill & Reynolds' No. 1 Donnelly is drilling at 3,361 feet. Port City Oil Co. has started drilling in No. 10 Heywood Brothers, which is down 572 feet.

On the east side, Yount Lee Oil Co. has abandoned its No. 5 Housierre-Latrielle in cap rock at 4,851 feet. This company's No. 3 Crowley is drilling shale and lime at 4,068 feet. The Texas Company is rigging up for No. 4 Rayne.

Edgerly—Calcasieu Parish

Drysdale & Savoy's No. 4 Hill was spudded during the week and is drilling at 712 feet. Rex Petroleum Co.'s No. 1 Narroni is drilling below 4,180 feet.

Vinton—Calcasieu Parish

Gulf Refining Co.'s No. 47 Star-Vincent is being rigged up to pump from a sand at 2,195 feet. Salt Dome Oil Co.'s No. 1 Shaw is drilling at 1,712 feet. Vinton Petroleum Co.'s No. 2 Gordon is drilling at 3,415 feet. This company also is preparing to deepen its No. 6 Rescue (5 acres).

Hackberry—Cameron Parish

Calcasieu Oil Co.'s No. 4 Valery is drilling at 3,568 feet. This company's No. 12 Watkins is in sand at 3,032 feet. Cameron Oil Co.'s No. 2 Duhon is drilling gumbo at 2,727 feet. Rycade Oil Corp.'s No. 1 Gulf Land is in gumbo at 1,805 feet. Shallow Oil Co. is in a sand and shale at a total depth of 1,715 feet and has set 6-inch casing at 1,711 feet. Yount Lee Oil Co.'s No. 22 Kelso Bayou is drilling hard sand at 2,735 feet. This company's No. 8 School Land is drilling rock at 3,371 feet.

Miscellaneous Fields

Sinclair Oil & Gas Co.'s No. 5 Norton, Damon Mound, is drilling sand clay at 934 feet. At Markham, Rycade Oil Corp. and Humble Oil & Refining Co.'s No. 2 Hudson is being worked over and probably will be deepened. This well was completed last August for 850 bbls. and opened production on the southeast flank of the dome.

Gulf Production Co.'s No. 17 Moore, Orchard, Fort Bend County, is drilling sandy shale at 4,175 feet. Fort Bend Oil Co.'s No. 1 Moore is drilling shale and lime at 2,620 feet. Gulf's No. 11 Moore, an old well being deepened, is drilling below 3,916 feet.

Yount Lee Oil Co.'s No. 3 Louisiana Petroleum Co., Anse La Butte, St. Martin Parish, is drilling rock at 2,678 feet. At Bayou Bouillon, Rycade Oil Corp.'s No. 3 Atchafalaya fee is drilling at 3,993 feet, and No. 4 Atchafalya at 3,668 feet. No. 4 Bouillon fee is down 3,091 feet and No. 5 at 3,005 feet.

Gulf Refining Co.'s No. 12 Lutcher-Moore, Starks, Calcasieu Parish, is drilling at 3,840 feet, and No. 12 Industrial at 3,505 feet. Pure Oil Co.'s No. 6 Yount Lee Oil Co., Sweet Lake Dome, is drilling sand and shale at 5,986 feet. Pure Oil Co. has made location for No. 7 Yount Lee Oil Co.

Miscellaneous Wildcats

Texas

Austin County—Gulf Production Co.'s No. 1 Jackson, on the San Felipe Dome, tested hot salt and sulphur water at 3,220-35 feet and is to be deepened. Dixie Oil Co.'s No. 1 Brazos, same dome, but in Waller County, drilled to 400 feet in sand but has been shut down because of high water, the test being in the river.

Brazoria County — Shell Petroleum Corp.'s No. 3 Reece, Allen Dome, is drilling hard shale at 1,898 feet. This company's No. 5 Allen, same dome, is drilling sandy, lime rock at 3,685 feet. At Stratton Ridge, Empire Gas & Fuel Co.'s No. 1 Brock is drilling rock at 1,620 feet. O. A. Meyers' No. 1 Davidson, Clemens Dome, is drilling sandy shale showing some oil at 619 feet.

Chambers County—Pure Oil Co.'s No. 2 Lost River, Lost Lake Dome, is drilling lime and shale showing some oil at 3,113 feet. A location has been made for No. 2 Lost Lake, 3,670 feet east and 3,600 feet south of the northwest corner of the Wallis Survey and 100 feet from the shoreline of the lake.

Colorado County—Alexander & Smith's No. 1 Kinkler, C. Amsler Survey, near Cat Springs, has resumed operations and is drilling shale at 3,120 feet. Rich Oil Corp.'s No. 1 Brune, northeast of Columbus is shut down temporarily in shale at 1,260 feet. The Texas Company's No. 1 Hoye, Eagle Lake, is drilling shale at 703 feet.

Fort Bend County — Gulf Production Co.'s No. 12 Wolf, Long Point, is drilling in gyp at 662 feet. West and associates' No. 1 Hartfield, Needville, is drilling shale at 3,109 feet.

Galveston County — Long and associates' No. 1 Irwine & Bishop, south of Dickinson, is drilling shale and gumbo at 2,735 feet. Republic Production Co.'s No. 1 Lobit, north of Dickinson, is drilling shale and lime at 2,565 feet.

Harris County—Humble Oil & Refining Co. has made location for another test at the old Hockley Dome, this to be the No. 5 Warren. Humble's No. 1 Minnetex at Mykawa, south of Houston, is drilling at 4,270 feet. Cedar Bayou Oil Co.'s No. 1 Johnson, 2 miles northwest of Barbers Hill, has resumed drilling and is in shale and lime at 4,240 feet.

Jackson County—The Texas Company's No. 1 Moore, D.&G.N. Survey, 16½ miles north of Edna, is drilling sand stone at 2,730 feet. Wright Brothers' now have no rigs running with the completion of their No. 7-A Drushel as a gasser the past week. No. 1 Lawrence, John McHenry Survey, 12 miles northwest of Edna, has been shut down a couple of weeks at 3,030 feet, and No. 2 Classen has drill stem stuck at 3,200 feet. No. 7-A Drushel made 12,000,000 feet of dry gas, 750 pounds pressure, from sand at 3,198-3,202 feet.

Jefferson County — Gulf Production Co.'s No. 2 Burrell, Fannette Dome, is drilling sand and shale at 4,210 feet. The Texas Company's No. 1 Pipkin, Big Hill, is drilling gumbo at 550 feet. Westbury Syndicate's No. 1 West is drilling around 1,050 feet in gumbo. Oswald Dome Syndicate's No. 3 Oswald, south of Cheek, is in drilling at 3,743 feet. Gaddy Oil Co.'s No. 1 Jones, north of Beaumont, is at 2,300 feet.

Liberty County—The Texas Company's No. 1 Davis, Davis Hill, is drilling shale, lime and boulders at 4,183 feet. Big Dome Interests' No. 1 Finley, northwest of Hardin, has been abandoned as dry at 4,334 feet. Humble Oil & Refining Co.'s No. 3 Sterling, Moss Bluff, is waiting cement to set at 2,743 feet. Sun Oil Co.'s No. 1 Kovalcik, North Dayton wildcat, has spudded in. Union Exploration Co. is rigging up for No. 1 Esperson, south of North Dayton.

Washington County—Sun Oil Co.'s No. 1 Marcus, Gay Hill, is drilling shale at 1,248 feet. No. 1 Einman is spudding.

South Louisiana

Acadia Parish—Gulf Refining Co. has abandoned as dry its No. 1 Housierre-Latrielle, Egan Dome prospect. The hole was put down approximately 5,800 feet without indications of a dome.

Ascension Parish—Gulf Refining Co. is rigging up for No. 11 United Land Co., Sorrento Dome, and has a location for No. 12. Burnside Oil Co.'s No. 1 Robert, fractional Section 13-10s-3e, is drilling around 800 feet. Triumph Oil Corp.'s No. 2 Lacy, Section 29-10s-4e, is shut down temporarily after spudding in. Big Dome Drilling & Development Co. has a location for No. 1 Miles.

Cameron Parish — Shell Petroleum Corp.'s No. 5 Watkins, Black Bayou, is in hard lime rock at 1,240 feet and setting 6-inch surface casing.

Iberia Parish—Louisiana Land & Exploration Co.'s No. 2 Averys Island, is drilling sand at 5,625 feet. This company's No. 3-A Vermillion Bay is drilling sand and boulders at 898 feet. Gulf Refining Co. has abandoned No. 2 Kling, Loureaville, at 2,400 feet. This company's No. 7-Z State, Loreauville, is rigging up.

Iberville Parish — Shell Petroleum Corp. is rigging up for No. 3 Wilbert, White Castle. Union Sulphur Co.'s No. 3 Schwing, Bayou Des Glaise, is drilling sand at 2,221 feet.

LaFourche Parish—Gulf Refining Co.'s No. 7 Stark, Thibodaux, is in cap rock at 1,331-42 feet.

OKLAHOMA FIELDS

(Continued from Page 54,
on the ground for No. 1 McBride, SW cor. NE, Section 31-17-5.

Logan County

Wirt Franklin and others' No. 1 Knecht, NW cor. Section 21-18-4w, Crescent-Lovell area, is dry and abandoned at 6,255 feet.

Major County

Keller and others' No. 1 Horton, C NE NE, Section 23-20-14w, is rigging up for a 4,500-foot test.

Marshall County

E. L. Smith Oil Co.'s No. 7 Null, SW cor. NW SW NE, Section 24-5s-5, is making 30 bbls. from sand at 659-69 feet.

Muskogee County

J. Summers and others moved a machine to the location for No. 1-A Howard, NE cor. NW NW NW, Section 29-15-16. Haynes and others' No. 1-A Crittenden, SW cor. NE, Section 6-14-19, is spudding. J. L. Selby's No. 7 Drew, SW cor. Section 31-15-15, has been completed for 5 bbls. in sand at 620-65 feet. B. H. Mills and others' No. 1 Brown, NW cor. NE, Section 19-13-19, has been completed for 11,986,000 feet of gas in sand at 768-800 feet.

Cherokee Public Service Co.'s No. 1 Jackson, SE cor. NE NE SW, Section 10-15-17, is dry and abandoned at 1,380 feet. Joe Paul and others' No. 4 James, SW cor. NW SW SW, Section 17-14-17, is dry and abandoned at 1,481 feet. J. A. Barbre's No. 1 Lewis, CWL SE NE, Section 8-13-16, has been abandoned at 2,050 feet. Blackwood & Schlitz' No. 1 Burr, NW cor. SE NE, Section 32-16-19, is dry and abandoned at 2,075 feet.

Okfuskee County

C. L. McMahon and others' No. 2 Hall, SW cor. SE NE, Section 29-12-10, is a rig on the ground. Champlin Oil & Refining Co. has the rig up for No. 1 Jacobs, NW cor. SW SE, Section 15-11-11. No. 1 Washington, SW cor. NW SE, Section 15-11-11, is a rig. Magnolia Petroleum Co. has moved a rig to the location for No. 1 Tiger, NW cor. NE, Section 25-11-10.

Devonian Oil Co.'s No. 4 Fier, NE cor. SW NE, Section 11-10-11, has been completed for 10 bbls. in Salt sand at 1,561-76 feet. W. L. Umbrum's No. 3 Simmer, NW cor. SE NE, Section 11-10-11, made 100 bbls. from Salt sand at 1,552-85 feet and Booch sand at 2,005-18 feet.

Atlantic Oil Producing Co.'s No. 1 Robinson, SW cor. NW SW, Section 12-10-11, has been completed for 50 bbls. in Booch sand at 2,029-34 feet. Ted Savoie and others' No. 1-A Hopwood, C SE SW, Section 11-11-11, is dry and abandoned at 2,750 feet. Kingwood Oil Co.'s No. 1 Holmes, SE cor. Section 16-11-11, is dry and abandoned at 3,536 feet in Wilcox sand. McCulloch Oil Co.'s No. 1-A Hully, NE cor. NW NE, Section 29-10-10, has been abandoned at 4,241 feet in Wilcox sand.

Okmulgee County

Papoose Oil Co.'s No. 20 Osborn, NW cor. SE SE, Section 21-15-14, is drilling at 2,275 feet. The Texas Company's No. 3 Asbury, NE cor. SE SE, Section 8-15-14, has been completed for 10,000,000 feet of gas in sand at 1,877-96 feet. A. McInturff's No. 2 Myers, CSL NW NE, Section 8-13-14, made a 5-bbl. well in sand at 1,284-1,303 feet. J. H. Rebold Oil Co.'s No. 10 Haskins, CNL NW SE, Section 22-13-12, made 15 bbls. from Booch sand at 1,745-60 feet. Denver Producers & Refiners Co.'s No. 2 Thomas, C NE NE, Section 32-13-11, is dry and abandoned at 3,435 feet.

Osage County

Lewis Production Co. and others' No. 1, SE cor. Section 15-26-6, Burbank Pool, is a rig. L. G. Stanley has a machine at the location for No. 3, SW cor. NW SE, Section 36-22-8. Peters Petroleum Co.'s No. 1, NE cor. SE SE, Section 8-21-9, is drilling at 200 feet.

R. L. Berlin's No. 10, SE cor. NE SE SW, Section 20-29-9, has been completed for 8 bbls. in sand at 1,476-1,503 feet. Peters Petroleum Co.'s No. 6, CSL NW, Section 26-25-9, swabbed 250 bbls. from sand at 2,106-74 feet. Silurian Oil Co.'s No. 4, SW cor. NE SE, Section 12-23-11, pumped 12 bbls. from Bartlesville sand at 1,488-1,540 feet. Clint Moore Estate and Ohio Osage Oil Co.'s No. 2, NE cor. NW, Section 16-21-9, swabbed 50 bbls. from Skinner sand at 2,040-73 feet. No. 18, SW cor. NW SW, Section 9-21-9, made a 30-bbl. well in sand at 284-315 feet. Superior Oil Corp.'s No. 2, NE cor. SW NE NW, Section 8-22-11, is dry and abandoned at 1,780 feet.

Pawnee County

Superior Oil Corp. has a machine at the location for No. 1 Higbee, CEL SW SW, Section 28-20-9. Peter Adamson, Jr.'s, No. 2, SE cor. SW SE, Section 24-21-7, made 50 bbls. from sand at 2,670-2,710 feet. Black and others' No. 5 Cotton, CSL SE NE, Section 6-20-8, is dry and abandoned at 2,810 feet.

Payne County

The Texas Company made location for No. 1 Cullison, NE cor. NW, Section 5-17-5. Location was also made for No. 2 Cardin, SW cor. SE, Section 32-18-5.

Sequoyah County

Sequoyah Gas Co.'s No. 2 Powell, C SE NW, Section 33-11-25, is drilling at 600 feet.

Stephens County

Roxana Petroleum Corp.'s No. 4 Cook "N," NW cor. NE SW, Section 30-1-8w, is rigging to deepen from 2,015 feet. Pace and others' No. 9 Wilson, NW cor. SE NE, Section 12-2s-8w, is rigging up. Heydrick and others' No. 1 Pool, NW cor. SW SW SW, Section 35-1s-8w, is rigging to deepen from 1,679 feet. Myer & Standorth's No. 1 Helder, CNL Section 10-2s-8w, is drilling at 1,381 feet. American Pipe Line Co.'s No. 3 Nigh, NW cor. SE NW, Section 34-1s-8w, is rigging up. Bundy & Denton's No. 1 Stephens, NE cor. SW, Section 16-1s-5w, is drilling at 20 feet. Magnolia Petroleum Co. made location for No. 1 West, SE cor. SW, Section 33-2s-5w.

Snodgrass Oil Co.'s No. 1 Malernee, SW cor. NE NW, Section 34-1s-8w, was deepened from 1,586 feet to 1,700 feet and made 25 bbls. Medlin and others' No. 4 Burke, SE cor. NW NW NE, Section 34-1s-8w, has been completed for 15 bbls. in sand at 1,676-82 feet. Randle & Muse's No. 1 Dare, SE cor. SW, Section 1-2s-8w, has been abandoned at 2,464 feet. Saterwood & Hart's No. 1 Farrout, NW cor. Section 9-1s-8w, is dry and abandoned at 2,503 feet.

Tulsa County

E. H. Cornelius' No. 1 Company, CEL NW NE, Section 32-19-12, made 3 bbls. from sand at 685-730 feet.

Wagoner County

C. W. Gillett's No. 6 McIntosh, NE cor. NW NW SE, Section 25-17-16, is dry and abandoned at 1,448 feet.

Woods County

Bu-Vi-Bar Petroleum Co. and others No. 1, SE cor. SW, Section 10-25-15w, is a rig moving in.

Pontotoc County

Royalty Oil & Refining Co. has the rig up for No. 2 Broughton, NW cor. SE NE, Section 36-5-6. Homaokla Oil Co.'s No. 14 McCall, NE cor. NW SE NW, Section 17-5-8, is rigging up rotary tools. The rig is being built for No. 15 McCall, NW cor. SE NW, Section 17-5-8. O. K. Portland Cement Co.'s No. 1 Alexander, C W half E half, Section 24-4-7, is rigging up.

Homaokla Oil Co.'s No. 5 McCall, SE cor. NW, Section 17-5-8, Allen Pool, swabbed 200 bbls. from Gilcrease sand at 2,502-23 feet. W. R. Ramsey's No. 2 Millner, NE cor. NW SW, Section 17-5-8, was deepened from 2,409 feet to Gilcrease sand at 2,547-2,688 feet and swabbed 22 bbls.

Pottawatomie County

Pure Oil Co. has the cellar dug for No. 1 Wiley, SE cor. NW, Section 8-5, Mission Pool. No. 2 Wiley, SW cor. SE NW, Section 8-8-5, is also a cellar. The callar has also been dug for No. 3 Wiley, SW cor. NW, Section 8-8-5. Wilcox Oil & Gas Co. made location for No. 1 Wilson, NW cor. SE, Section 8-8-5. Sinclair Oil & Gas Co.'s No. 5 Neeley, NW cor. SW SW, Section 25-7-4, Louis Pool, is rigging up rotary.

Gypsy Oil Co. made location for No. 1 Roseman, SE cor. NW NE, Section 26-7-4. Magnolia Petroleum Co. made location for No. 2 Cherry, CNL S half NE

Section 26-7-4. Pure Oil Co. made location for No. 4 Thomas, CSL NE NE, Section 26-7-4. Sinclair Oil & Gas Co. has the rig on the ground for No. 2 Bruno, CSL N half NE, Section 26-7-4.

Gypsy Oil Co.'s No. 3 Bruno, SW cor. NE NW, Section 25-7-4, pumped 60 bbls. from sand at 4,395-4,438 feet after plugging back from Wilcox sand at 4,454 feet. Sinclair Oil & Gas Co.'s No. 3 Kitch-ee, SE cor. SW SW, Section 19-7-5, drilled to 4,308 feet in Wilcox sand and plugged back to 4,208 feet in Simpson sand where it pumped 10 bbls. Magnolia Petroleum Co.'s No. 1 Fyke "C," NE cor. SE SE, Section 20-7-5, swabbed 56 bbls. from Simpson sand at 4,130-4,200 feet after plugging back from 4,262 feet in Wilcox sand.

Gypsy Oil Co.'s No. 5 Stahl, SE cor. NE NE, Section 30-7-5, flowed 3,260 bbls. from Wilcox sand at 4,242-63 feet. No. 6 Stahl, NW cor. SE NE, Section 30-7-5, made 2,510 bbls. from Wilcox sand at 4,275-99 feet. T. B. Slick's No. 4 Lynn, NW cor. NE NW, Section 30-7-5, pumped 80 bbls. after plugging back from 4,280 feet in Wilcox sand to 4,277 feet. The Prairie Oil & Gas Co.'s No. 3 Ellison, SW cor. NE SW, Section 25-7-4, St. Louis Pool, made 865 bbls. from Simpson sand at 4,385-91 feet. No. 2 Wolfe, SE cor. NW NW, Section 29-7-5, made 1,360 bbls. from Wilcox sand at 4,383-96 feet.

Seminole County

Darby Petroleum Co. has the rig on the ground for No. 1 Judy, NE cor. SW SE, Section 1-8-5, Mission Pool. Sinclair Oil & Gas Co. is erecting the rig for No. 1 Judy, NE cor. NW SE, Section 1-8-5. Location was also made for No. 2 Judy, SE cor. NW SE, Section 1-8-5. Barnsdall Oil Co. is erecting the rig for No. 2 Fife, SW cor. NE NW, Section 14-8-5. The rig for No. 3 Fife, NW cor. SE NW, Section 14-8-5, is also under construction. Magnolia Petroleum Co. has the rig up for No. 1 Killing, SE cor. NW NW, Section 14-8-5. W. B. Pine is moving in rotary tools for No. 1 Harjo, SW cor. SE, Section 6-8-6. Location has been made for No. 2 Harjo, NE cor. SW SE, Section 6-8-6.

Sinclair Oil & Gas Co. is building the rig for No. 1 Hardy, NW cor. NE SW, Section 7-8-6. No. 2 Hardy, NE cor. SW, Section 7-8-6, is also a rig being built. The rig is going up for No. 3 Hardy, SE cor. NE SW, Section 7-8-6. T. B. Slick has the rig on the ground for No. 1 Smith, NW cor. SE SE, Section 7-8-6. W. B. Pine is moving rotary tools in for No. 1 Micco, NW cor. NE NW, Section 8-8-6. No. 2 Micco, NE cor. NW, Section 8-8-6, is a location. T. B. Slick made location for No. 1 Sancho, SE cor. NW, Section 4-8-7. The Prairie Oil & Gas Co. has the cellar dug for No. 1 Harjo, SW cor. NE NE, Section 24-8-5.

Transcontinental Oil Co.'s No. 4 Ogle, SW cor. NE NE, Section 4-9-9, has been abandoned at 3,794 feet in Hunton lime. Carter Oil Co.'s No. 4 Jackson, NW cor. NE, Section 11-7-6, Little River Pool, made 665 bbls. from Wilcox sand at 4,241-72 feet. Continental Oil Co.'s No. 2 Milsey, NE cor. SW SW, Section 11-7-6, has been completed for 1,400 bbls. in Wilcox sand at 4,362-75 feet. T. B. Slick's No. 2 Williams, SE cor. NE, Section 15-7-6, lost the hole at 4,345 feet and has been abandoned. Carter Oil Co.'s No. 2 L. Cudjo, NE cor. NW SE, Section 23-7-6, made 235 bbls. from Wilcox sand at 4,480-81 feet.

The Texas Company's No. 4 Hotulke, SE cor. SW NW, Section 23-7-6, swabbed 450 bbls. from Wilcox sand at 4,489-4,501 feet. Tidal Oil Co.'s No. 1 Harrison, NW cor. Section 10-7-7, is dry and abandoned at 4,500 feet in Wilcox sand at 4,498-4,500 feet. W. R. Ramsey's No. 1 E. Factor, NW cor. NE NE, Section 25-7-7, is dry and abandoned at 2,851 feet. Indian Territory Illuminating Oil Co.'s No. 2 Fleet, SE cor. SW, Section 18-5-8, made 619 bbls. from Cromwell sand at 2,604-47 feet.

Okfuskee County

T. B. Slick made location for No. 1 Brown, SE cor. NE SE, Section 21-11-7. The production of the Greater Seminole area by companies and leases on Friday, November 16, follows:

Little River Pool

Company, farm—	Location	Wells	Prod.
Amerada:			
Nitey	2- 7-6	3	825
Amerada-Wilcox:			
Fore	35- 8-6	2	280
Barnsdall:			
Cotcha	23- 7-6	2	1,175
Hotulke	22- 7-6	2	399
Walker	4- 7-6	1	105
Blackwell:			
Baker	11- 7-6	4	1,370
Nitey	35- 8-6	6	1,902
Talley	14- 7-6	4	1,030
Bryan & Emery:			
Walker	4- 7-6	1	12
Carter:			
Cotcha, M.	23- 7-6	3	225
Cudjo, L.	23- 7-6	1	200
Fish	36- 8-6	4	500
Harjo, C.	11- 7-6	3	6,220
Harjo, M.	13- 7-6	2	840
Jackson	11- 7-6	4	1,150
Larney	24- 7-6	3	1,602
Lena	10- 7-6	1	855
Moore	11- 7-6	2	630
Tewee	14- 7-6	5	3,365
Thomas	11- 7-6	1	390
Wilson	12- 7-6	2	565
Champlin:			
Tewee	14- 7-6	3	1,989
Continental:			
Cosar	36- 8-6	7	1,900
Cosar, M.	25- 8-6	1	417
Continental & Fisher:			
Milsey	11- 7-6	2	1,760
Empire:			
Charty	24- 7-6	1	598
Coker	13- 7-6	1	1,230
Sandlin	3- 7-6	1	10
Gypsy:			
Brown, C.	33- 8-6	2	717
Brown, M.	33- 8-6	3	1,162
Campbell	33- 7-6	2	40
Conard	22- 7-6	2	800
Cosar, M.	25- 8-6	1	....
Cosar, W.	36- 8-6	2	245
Cotcha	23- 7-6	4	1,597
Denmark	11- 7-6	4	3,123
Hulhoke	14- 7-6	10	4,605
Mungee	1- 7-6	1	15
Pottie	35- 8-6	4	660
Renton	11- 7-6	3	735
Independent:			
Davis, R.	13- 7-6	3	1,530
Tewee	14- 7-6	6	3,491
Williams	15- 7-6	1	730
Independent & Highway:			
Harris	23- 7-6	8	2,381
Independent & White Eagle:			
Davis	2- 7-6	4	855
I. T. I. O.:			
Campbell	1- 7-6	1	170
Dungan	35- 8-6	3	867
House, M. A.	1- 7-6	1	62
House, W. E.	1- 7-6	1	27
House "B"	2- 7-6	4	646
Hull	26- 8-6	3	592
Jackson	1- 7-6	3	727
McCulla	1- 7-6	3	463
Nitey	2- 7-6	6	188
Phoebe "A"	36- 8-6	3	210
Phoebe "B"	36- 8-6	4	166
Reed	1- 7-6	1	21
Soketheche	1- 7-6	3	544
Magnolia:			
Cruse	2- 7-6	4	458
Denby	11- 7-6	3	1,144
Dixon	31- 8-7	1	1
Harjo, A.	14- 7-6	2	300
Harjo, B.	14- 7-6	2	904
Pottie	35- 8-6	4	545
Reed, E.	31- 8-7	1	23
Reed, I.	22- 7-6	3	946
McCulloch & Sands:			
Harrison	4- 7-6	1	57
Mid-Continent:			
Brunner	11- 7-6	4	1,610
Eleck	23- 7-6	1	285
Smith	5- 7-7	1	3,625
Wadsworth	36- 8-6	7	350
W. B. Pine:			
Hoyecha	26- 8-6	6	2,812
Pine-Phillips:			
Pottie	35- 8-6	2	355
Prairie:			
Chilcoat	25- 8-6	3	640
Dungan	35- 8-6	1	20
Gibson	14- 7-6	5	2,310
Harris	14- 7-6	4	1,775
House	2- 7-6	4	305
Moppin	24- 7-6	1	385
Talley	14- 7-6	4	1,815
Prairie & Amerada:			
Sunny	14- 7-6	8	5,650
Pure:			
Brinson	24- 7-6	1	645
Cotcha	14- 7-6	9	4,001
Harjo	11- 7-6	4	1,014
Reiter-Foster:			
Bunyard	14- 7-6	4	2,895
Roxana:			
Caesar	11- 7-6	1	20
Hotulke	23- 7-6	4	934
Johnson	13- 7-6	3	2,588
Shaffer:			
Narcome	36- 8-6	2	175
Sinclair:			
Cosar	30- 8-6	3	750
Haney	12- 7-6	1	102
Tewee	14- 7-6	2	1,865
Sinclair & Kingwood:			
Pompey	24- 7-6	1	255
Skelly:			
Carl	14- 7-6	2	1,734
Slick:			
Reed	13- 7-6	1	1,225
Williams	15- 7-6	2	620
Wood	26- 7-6	1	550
Snowden-McSweeney:			
Tiger	13- 7-6	3	37
Superior:			
Potulka	31- 8-6	1	5
Soketheche	1- 7-6	1	10
Texas:			
Brooks	25- 8-6	1	87
Coker	1- 7-6	3	495
Janey	11- 7-6	3	905
Texas & Independent:			
Hotulke	23- 7-6	4	1,920
Tidal:			
House	1- 7-6	3	470
Johnson	1- 7-6	1	25
Twin States:			
Lowe	25- 8-6	1	115
Reiter-Foster et al:			
Jefferson	31- 7-6	1	40
Total		301	109,130

Maud Pool

Amerada:			
Gossland	8- 8-5	1	....
Hallum	1- 8-4	1	720
Barnsdall:			
Fife	14- 8-5	1	1,500
Gypsy:			
Bourassa	7- 8-5	1	....
I. T. I. O.:			
Simpson	10- 8-5	1	48
State	16- 8-5	1	....
Pure:			
Lindly	18- 8-5	1	....
Total		7	2,268

Mission Pool

Carter:			
Fuswa	18- 8-6	1	....
Micco	8- 8-6	1	....
Gypsy:			
Baby	6- 8-6	1	25
Barkus	6- 8-6	1	....
Dosar	7- 8-6	1	....
Mission	5- 8-6	1	....
Mosar	1- 8-5	1	....
Marland:			
Maines	7- 8-6	1	105
Mid-Kansas:			
Moore	7- 8-6	1	90
Roxana:			
Maines	7- 8-6	1	....
Roxana & Marland:			
Hernsdon	7- 8-6	1	254
Twin States:			
Hayes	8- 8-6	1	50
Total		12	524

Bowlegs Pool

Amerada:			
Roscoe	15- 8-6	8	1,410
Atlantic:			
Baker	10- 8-6	4	425
Fleet	23- 8-6	3	126
Grayson	13- 8-6	4	610
Jones, A.	16- 8-6	2	50
Jones, C.	9- 8-6	1	155
Barnsdall:			
McNac	28- 8-6	1	22
Murrow	11- 8-6	4	517
Carter Oil:			
Bowlegs	15- 8-6	4	867
Burden	22- 8-6	2	200
Harjoche	14- 8-6	6	760
Hilly	23- 8-6	3	660
Jones	11- 8-6	4	545
Walker	15- 8-6	4	590
Wise	23- 8-6	11	1,935
Dixie:			
Culley	11- 8-6	1	90
Empire:			
Lacy	14- 8-6	6	535
Wise	23- 8-6	2	112
Gypsy:			
Bowlegs	22- 8-6	1	220
Bradley	9- 8-6	1	2
Cumsey	10- 8-6	4	830
Grayson	13- 8-6	4	495
Harjoche	10- 8-6	3	900
Jones	11- 8-6	1	92
Walker	15- 8-6	7	977
Wise	23- 8-6	2	250
I. T. I. O.:			
Barnett	24- 8-6	2	253
Barnett "B"	23- 8-6	1	118
Billington	22- 8-6	5	339
Bowlegs	22- 8-6	10	1,501
Davis	13- 8-6	4	710
Fay	13- 8-6	9	1,549
Goforth	15- 8-6	12	1,275
Livingston	15- 8-6	10	2,098
Lizzie	13- 8-6	3	242
Walker	15- 8-6	8	796
Williams	12- 8-6	1	237
Wilmott	15- 8-6	4	307
Work	24- 8-6	1	107
Youngblood	24- 8-6	2	70
Magnolia:			
Davis	13- 8-6	3	372
Davis, M.	13- 8-6	1	176
Hammond	10- 8-6	8	952
Rhodos	12- 8-6	5	1,645
Van Buskirk	9- 8-6	2	608
McCulloch:			
Bowlegs	22- 8-6	2	210
Mid-Continent:			
Baker	10- 8-6	4	629
Bowlegs	22- 8-6	1	5
Smith	12- 8-6	6	530
Minnehoma:			
Bowlegs	15- 8-6	4	356
Prairie:			
Gahagan	23- 8-6	3	400
Harber	10- 8-6	8	2,685
Jones	11- 8-6	4	320
Templeton	12- 8-6	5	2,060
Whitney	23- 8-6	4	560
Pure Oil:			
Reed	14- 8-6	14	3,495
Strother "D" 11 &	14- 8-6	4	454
Strother "F"	10- 8-6	7	2,535
Roxana:			
Taylor	16- 8-6	5	265
Shaffer:			
Lacy	14- 8-6	3	415
Sinclair:			
Cumsey	10- 8-6	4	925
Ellep	11- 8-6	6	1,342
Harjo	14- 8-6	3	660
Jones	9- 8-6	7	585
Taylor	10- 8-6	4	1,120
Taylor, W.	10- 8-6	3	615
Walker	22- 8-6	4	675
Slick:			
Jones	3- 8-6	1	218
Texas:			
Reed	14- 8-6	11	900
Tidal:			
Grayson	13- 8-6	4	325
Harjoche	10- 8-6	6	1,160
Twin States:			
Jones	11- 8-6	1	....
Total		312	50,168

Earlsboro Pool

Amerada:			
Anderson	15- 9-5	2	519
Cowden	4- 9-5	7	1,193
Rogers	3- 9-5	2	10
Atlantic & Sinclair:			
Foreman	18- 9-5	1	140
Barnsdall:			
Brown	10- 9-5	4	1,730
Bruner, F.	2- 9-5	3	327
Bruner, N.	10- 9-5	3	1,047
Cudjo	14- 9-5	1	23
Davis, D.	11- 9-5	3	194
Davis, J.	11- 9-5	4	1,515
Davis, M.	17- 9-5	2	31
Gibson	9- 9-5	8	1,965
Hern	15- 9-5	1	2
Ingram	1- 9-5	8	779
Pack, S.	10- 9-5	4	149
Peter	10- 9-5	4	30
Sango	1- 9-5	4	2,125
Sebalka	15- 9-5	1	240
Sullivan, H.	11- 9-5	1	....
Sull-Harjo	10- 9-5	2	36
Wasutke	12- 9-5	4	1,042
Burke-Greis:			
Wisner	6- 9-6	1	....
Carter:			
Davis	13- 9-5	2	220
James	6- 9-6	5	3,540
Sango	1- 9-5	1	5
Continental:			
Kays	2- 9-5	2	12
Spencer	12- 9-5	4	1,000
Empire:			
Barker	12- 9-5	1	80
Edmendson	3- 9-5	3	145
Gypsy:			
Bruner	19- 9-5	4	3,400
Carter, B.	11- 9-5	8	3,320
Earl	16- 9-5	1	18
Hunick	5- 9-5	2	2,320
Noble	12- 9-5	4	1,665
Peter	10- 9-5	3	240
Sango	1- 9-5	11	4,594
State	16- 9-5	4	1,112
Independent:			
Bruner	10- 9-5	3	467
Sullivan	10- 9-5	1	20
Knapp	8- 9-5	3	1,295
Independent-Margay:			
Gains	11- 9-5	3	488
Magnolia:			
Bryant	9- 9-5	6	385
Cowden	4- 9-5	4	30
Dixon	12- 9-5	1	22
Edmondson	3- 9-5	2	5
Holmsley	11- 9-5	7	719
Hyde	13- 9-5	1	1,543
Ingram	10- 9-5	1	15
Lena	10- 9-5	3	51
Seay	12- 9-5	9	2,350
Simpson	10- 9-5	4	434
Sparks	11- 9-5	7	771
Sullivan	12- 9-5	3	111
Mid-Continent:			
McCumber	9- 9-5	7	65
Rogers	5- 9-5	1	1,125
Mid-Kansas:			
Anderson	14- 9-5	3	50
Phillips:			
Dunaway	14- 9-5	1	20
Prairie:			
Baker	24- 9-5	1	50
Davis	13- 9-5	3	2,550
Graham, C.	3- 9-5	2	15
Graham, O.	10- 9-5	4	1,065
Stidham	11- 9-5	11	2,035
Roxana:			
Bayless	17- 9-5	1	13
Hearn	13- 9-5	1	122
Spencer	12- 9-5	2	1,338
Shaffer:			
Clark	1- 9-5	3	136
McCoy	36-10-5	1	1,020
Sinclair:			
Foreman	18- 9-5	1	15
Hollins	12- 9-5	1	50
Sango	2- 9-5	4	2,845
Skelly:			
Mays	1- 9-5	2	2,614
Shepard	6- 9-6	1	756
Spencer	12- 9-5	1	478
Skelly & Atlantic:			
Sherry	6- 9-6	2	1,696
Slick et al:			
Campbell	6- 9-6	2	4,310
Superior:			
Ingram	1- 9-5	1	883
Walker	2- 9-5	3	2,714
Texas:			
Anderson	2- 9-5	8	300
Brown	10- 9-5	8	337
James	6- 9-6	1	440
Rogers	5- 9-5	4	2,380
Wilmott	10- 9-5	7	590
Tidal:			
Walker	35-10-5	1	1,825
Watkins	9- 9-5	7	2,290
Twin States:			
Barker	12- 9-5	3	59
Hern	2- 9-5	4	215
Total		285	77,905

Seminole Pool

Amerada:			
Fixico	23- 9-6	4	391
Killingsworth	23- 9-6	4	424
Rentie	23- 9-6	3	218
Atlantic:			
Cudjo, N.	35- 9-6	3	500
Barnsdall:			
Carter	24- 9-6	7	297
Henry	14- 9-6	2	500
Jones	34- 9-6	4	1,139
Carter Oil:			
B. Carter	24- 9-6	2	150
F. Carter	23- 9-6	3	107
Creamer	34- 9-6	2	12
Cudjo, R.	35- 9-6	4	210
Cudjo, W.	34- 9-6	1	27
Gilliland	27- 9-6	1	180
Grisso	23- 9-6	4	425
Grisso, M.	15- 9-6	1	175
Killings, G. F.	14- 9-6	4	55
Killings, M. E.	23- 9-6	12	4,900
Knapp	13- 9-6	3	20
Lukes	27- 9-6	5	1,075
Pounder	34- 9-6	2	150
Simpson	35- 9-6	2	180
Strothers	34- 9-6	4	542
Vierson	23- 9-6	2	50
Empire:			
Gross	25- 9-6	2	50
Wilson	34- 9-6	2	288
Gypsy:			
Butler	35- 9-6	4	567
Carter	24- 9-6	8	637
Cudjo	34- 9-6	4	297
Fixico	26- 9-6	7	185
Harjo	25- 9-6	3	580
Wolfe	26- 9-6	6	40
Independent:			
Fixico, P.	23- 9-6	3	480
Harjo	25- 9-6	2	125
Butler	35- 9-6	3	1,340
Fixico, T.	26- 9-6	6	342
Jones	26- 9-6	4	382
I. T. I. O.:			
Allen	25- 9-6	2	102
Bowlegs	26- 9-6	12	2,265
Goodin	23- 9-6	3	387
Harjo	23- 9-6	3	54
James	24- 9-6	2	518
Reed	24- 9-6	1	10
Kingwood:			
Johnson	22- 9-6	3	453
Magnolia:			
Boren	2- 8-6	1	....
Franks	25- 9-6	3	524
Mid-Continent:			
Rentie	14- 9-6	9	370
Tayeche	24- 9-6	7	195
Phillips:			
Strothers	27- 9-6	2	90
Prairie:			
Gross	25- 9-6	5	55
Mason	36- 9-6	1	65
Spencer	12- 9-6	1	10
Strothers	27- 9-6	8	2,400
Pure Oil:			
Strothers	26- 9-6	17	6,129
B. Strothers	36- 9-6	4	1,341
S. Strothers	34- 9-6	1	520

(Continued on Page 144)

Big Amalgamation in Oil Tool Industry

Five Important Manufacturing Concerns in California Purchased by the Byron Jackson Pump Co. of Los Angeles

The largest amalgamation in the history of the oil tool industry has been concluded through the purchase of five important manufacturing concerns by the Byron Jackson Pump Co. of Los Angeles and San Francisco, according to announcements by this organization.

The purchase and amalgamation represents a sum totaling several millions of dollars, and involves the firms of Wilson & Willard Manufacturing Co., Wilson Oil Tools Corp., Rotary Disc Bit Co., U. S. Tool Co. and the Craig Oil Tool Co.

An official announcement from Byron

E. CLEM WILSON

Jackson, Inc., the new organization's name, giving details of the purchase of the five companies, also gives an outline of the new alignment. Byron Jackson, Inc., according to the announcement, will be composed of three major divisions —the oil tools division, the disc bit division and the pump division.

The former Wilson & Willard Manufacturing Co. will cease to exist, and the Wilson Oil Tools Corp. will continue to function as the oil tools division of Byron Jackson, Inc. In other words, both the former Wilson companies will constitute the oil tools division of Byron Jackson.

The personnel of Wilson & Willard, however, both of the manufacturing company and the oil tools corporation, will remain the same. No change is contemplated in the executive or technical staffs, and the oil tools division of Byron Jackson, Inc., will function under the same chiefs who operated the Wilson & Willard concerns: namely, E. Clem Wilson, president; Webb W. Wilson, vice president and manager; and G. B. Wilson, treasurer.

The large Wilson plant at 2301 East Vernon Avenue, Los Angeles, will remain as the headquarters and factory of the oil tools division, to change only in the direction of improvement plans and anticipated expansion.

The disc bit division of Byron Jackson, Inc., will include three formerly separate companies, the Rotary Disc Bit Co. of Los Angeles, the U. S. Tool Co. of Long Beach, and the Craig Oil Tool Co. of Long Beach. In this division will be associated executives of the former companies, all well known in the oil tools manufacturing industry. They are W. W. Cole, formerly with the Craig Oil Tool Co., M. G. Brumley, formerly of the Rotary Disc Bit Co., and W. T. Woods, formerly of the U. S. Tool Co.

Headquarters of the disc bit division of Byron Jackson, Inc., will be at 2150 East Slauson Avenue, Los Angeles.

The pump division will maintain offices both at Berkeley and Los Angeles and will be largely under the guidance of W. N. Beadle, for many years identified as an executive of Byron Jackson.

Officers of New Organization

The officers of Byron Jackson, Inc., as named in the announcement, are: J. B. Keating, president; Robert Schurman, executive vice president and director of all divisions, and H. J. Ellen, secretary-treasurer.

It is the intention of Byron Jackson, Inc., the announcement declares, to continue the manufacturing operations of the oil tools division in the large plant of Wilson & Willard, while the disc bit division will turn out its products at the Slauson Avenue plant, which is now being expanded and improved at a cost totaling several hundred thousands of dollars. The original plant of the U. S. Tool Co. at Long Beach will be converted into a field service depot for the reconditioning of oil tools.

In the Mid-Continent area, headquarters for Byron Jackson, Inc., including all field administrative units of all products of the three divisions, will be established at Tulsa. In the same city, service shops will be opened to serve every branch of the industry touched upon by Byron Jackson products. In a similar plan, factory representatives will be maintained in the fields of the Mid-Continent region and the Gulf Coast territory.

In New York City, a divisional office will be created to care for the entire Byron Jackson export service.

In the new organization, Byron Jackson, Inc., will command manufacturing facilities aggregating in space 17 acres, divided as follows: Wilson-Willard plant, 6 acres; U. S. Tool service plant, 2 acres; the enlarged disc bit plant, 3 acres, and the Byron Jackson plant at Berkeley, 6 acres. More space, of course, will be taken up by Byron Jackson at Tulsa and at the various strategic points

WEBB W. WILSON

where the new organization is to maintain units.

Building Program

The new Slauson Avenue plant, which is to house the disc bit and pump division, is now being tripled in capacity and is expected, upon completion, to be the most modern plant in America for the manufacture of oil field tools. Two large single machine shop units, one 27,000 square feet and the other 30,000 square feet in area, with a warehouse of 15,000 square feet space and an administrative office two stories in height commanding 9,000 square feet of space, will form the bulk of the Slauson Avenue housing. The administrative offices are of brick and steel, embodying every known industrial refinement of organized directive facilities.

The new manufacturing plant at Slauson Avenue will include two machine departments, a raw material department, a testing and inspecting department, a tool room and a heat treating laboratory. This

M. G. BRUMLEY

last facility is to contain every refinement in the scientific treatment of metals, and will enable Byron Jackson to fulfill every possible specification needed in the oil tool industry, it is declared.

"All human factors in the testing of metals have been eliminated to the limits made possible by modern developments in the physical and chemical sciences," declared Robert Schurman, vice president.

Facilities at the oil tools division plant, where the Wilson products will continue to be made, may be enlarged in the near future to take care of increasing business. This plant now houses a machine department, a forge shop, a pattern making department, an engineering department, a testing and inspecting department and the warehouses and room for raw stock and finished products.

History of Concerns

Some idea of the importance of the amalgmation may be gleaned from a casual survey of the history and influence of the companies involved. The purchaser, Byron Jackson, Inc., was established in 1872 as a modest iron works, and shortly began making pumps of various descriptions. At present, Byron Jackson makes a complete line of centrifugal, turbine, hot oil, pipe line and refinery pumps.

Wilson & Willard Manufacturing Co. was incorporated by the Wilson brothers in 1907, having been actually established in 1904. The Wilson elevator, introduced more than 20 years ago, revolutionized the handling of pipe and casing and replaced the old Scott and Fair elevators then in use. Under the guidance of E. Clem Wilson, the firm developed many basic types of elevators, tongs and underreamers.

E. Clem Wilson is credited with the invention of the center-latch and the side-door types of elevators, now a common necessity in the oil fields. More than a generation ago, E. Clem Wilson invented the original improved underreamer with a one-piece body, which has been standard equipment in the oil fields of the world for more than 20 years. He also introduced the spring-latch feature in elevators and tongs.

The Rotary Disc Bit Co. was established in 1912 in Bakersfield and moved to Los Angeles 10 years ago. This concern controlled basic patents in the manufacture of disc bits. The U. S. Tool and the Craig Oil Tool Companies have operated in the Long Beach region for many years, supplying disc bits and other oil field specialties.

"The amalgamation, apart from the important and large financial elements involved, is of special significance to the oil industry, being as much an amalgamation of skill and experience as a merger of physical assets. Greater quantity purchases, resulting in tremendous savings to both manufacturer and consumer, greatly increased marketing facilities, and incalculable benefits to the industry from the point of view of service to producers, will follow the amalgamation," declared Mr. Schurman.

In order that the industry may be advised of the products manufactured by the various divisions of Byron Jackson, Inc., the following tools are reported in the lists in the new organization:

Oil Tools Division

Wilson underreamers, Wilson tongs and elevators for casing, pipe and tubing, for both rotary and standard service; Wilson circulating head; Wilson rotary drive bushing; Wilson piston and valves for slush pumps; Wilson 2-ply slotted screen pipe.

Disc Bit Division

Craig, U. S. and rotary disc bits; Craig and pep pistons for slush pumps; rotary flow beans; rodisco stuffing boxes and gland packing; drill collars, rock bit cones, subs and B. J. antifriction tool joints and collars.

A reciprocal licensing arrangement concluded with the Patterson-Ballagh Corp. of Los Angeles for the adoption of

ROBERT SCHURMAN

Bettis protectors on the B. J. antifriction tool joints and collars under the Hopkins and Bettis patents, allows the disc bit division to co-operate with Patterson-Ballagh in the distribution of Bettis protectors and in turn allows Patter

(Continued on Page 129)

Properties Required in Motor Fuels

German Scientists Determine Desirable Characteristics Obtained in Products Obtained From Several Sources

By Charles E. Kern
Washington Bureau, The Oil and Gas Journal

WASHINGTON, D. C., Nov. 8.—"Properties required of liquid fuels for use in automobile and airplane engines and how the oil industry meets these requirements," is the subject of a paper presented to the Fuel Conference of the London World Power Conference by W. Ostwald of Germany. This paper gives an extended survey of the results of German technologists in relation to liquid fuels and the requirements of the automobile and aircraft industries in Germany. It indicates the views entertained by German oil technologists on many problems involved in a study of liquid fuels.

The paper was presented in German from which an English version in abridged form was presented as follows:

At the present time the substances employed as fuels for internal combustion engines include hydrocarbons, alcohols and certain organic compounds. As these substances only supply their energy indirectly, that is, by the change in volume which occurs when they are burnt, the relative value of a fuel must be determined by its calorific value which itself is determined by (a) the carbon content, (b) the hydrogen content, (c) the oxygen content in the sense that the presence of oxygen represents partial combustion and reduces the calorific value, (d) the form in which these elements are combined, viz, aliphatic hydrocarbons have a lower calorific value than, for example, benzol or acetylene, and (e) the impurities present. (The calorific value of sulphur is determined by the manner in which it is combined, while inorganic matter—ash—reduces the calorific value in the proportion in which it is present.)

Knowing the proportions in which the various constituents are present, it is, therefore, possible to calculate the calorific value of the fuel. In general, the smaller the weight of fuel necessary to produce a definite amount of heat, the better the fuel. This can be seen from Table 1 in which the weight (in grams) necessary to produce 1,000 k cals. is given for several fuels.

Table 1

Benzine	95
Benzol	104
Spirit	165
Methanol	214

As, in order to ensure greater freedom of motion and a larger sphere of action, mechanical transport units must carry their source of power, this "energy-weight" is of considerable importance. A more convenient method of expressing the value of a fuel, however, is by means of the "energy-volume," that is the volume of fuel required to furnish a definite amount of energy. In Table 2 the volumes in cubic centimeters required to give 1,000 k cals. are shown.

Table 2

Benzine	127
Benzol	119
Spirit	204
Methanol	271

This value is particularly useful, for by means of it the radius of action of a motor vehicle can be estimated from its tank capacity.

Energy Price

As fuels are sold by volume, the price of a fuel per unit of energy can be calculated from the "energy volume." Actually, ceteris paribus, this "energy price" forms a useful basis for the evaluation of a fuel, although it varies with the state of the market.

The "energy price" of low-boiling fuels such as benzine is very much higher than that of the high-boiling or heavy fuels—an incentive to the chemist to produce high "energy price" fuels from the cheaper, heavier raw materials.

Apart from the fuel itself, oxygen must also be considered as an energy bearer and taken into account. Under normal conditions there is no need to consider it except as a basis when studying the effect it produces at other pressures. Although it cannot alter the calorific value of fuel, at low pressures, e.g., at great heights, it affects the compression and carburation systems. So far (in spite of the five-fold power volume ratio it affords) pure oxygen has not been used for internal combustion engines on account of the high temperatures produced and other technical difficulties.

The essential features of a fuel for automotive engines are low cost and high ton mileage, and, to secure the former, thermal efficiency is often sacrificed. The wide range of uses to which such fuels are put, from driving private cars to driving lorries or fishing boats indicates that two types of fuel are really necessary, one a "luxury" fuel and the other a "useful" fuel. While the chief requirements of the former include easy starting, rapid acceleration, clean burning and absence of odor both before and after combustion, those of the latter are cheapness and high ton mileage. The cost of the "luxury" fuel must, on account of the extra cost of production, be higher than that of the "useful" fuel.

Between the engine designer and the fuel chemist two classes of fuels have been developed. Although differing considerably in boiling range, these fuels are essentially the same. One is low boiling and is used in the constant-volume cycle engine, while the other boils over a very much higher range and is employed in Diesel engines. At present, the lighter of the two fuels is the less economical.

Engine Design

Fuel development and engine design have influenced each other. For example, the constant-volume cycle engine has been improved by increasing the compression ratio, this being rendered possible by the production of fuels stable to high compression, such as aromatic, naphthenic or alcoholic fuels. "Anti-knocking" agents have also been developed for increasing the stability of fuels towards high compression. On the other hand, the advent of the high speed Diesel engine has resulted in lower compression ratios being used and also in a considerable decrease in engine weight. For this type of engine, the aliphatic fuels are preferred, on account of their low spontaneous ignition temperatures or "pro-knocking" tendencies.

The need for a heavy oil carbureting system for airship and airplane use will exist until a light Diesel engine is available, owing to the particular risk of fire on aircraft. The care taken of airplane engines and the steady output required of them are both factors in favor of the development of this type of engine. It would, therefore, seem worth while examining the behhavior of a close cut hydrocarbon fuel, boiling at approximately 180 degrees Centigrade (which would lessen the risk of fire) in a carbureting system.

Corrosive Action

Copper, lead, zinc, aluminum, magnesium and their alloys are all employed in the fuel systems of automotive engines. All are liable to be corroded by the fuel and, unless precautions are taken, this corrosion may become so serious that the pipes of the fuel system become choked. The cause of the corrosive action are acid remaining from the refining, free and combined sulphur (sulphur in thiophene, carbon disulphide, etc., is not corrosive), aromatic hydroxyl compounds resulting from poor refining.

Sulphur is particularly corrosive towards brass and copper; tin, on the other hand, is immune from all the corrosive agents mentioned and can be used to protect tubes, etc. Until all fuel systems are protected by tinning, however, the fuel must be noncorrosive.

The corrosive action of a spirit is tested by observing its action on strips of various metals placed in it.

Stability

It is essential that a fuel should stand storage for at least six months without alteration in closed tanks, whether galvanized, lead-coated or not.

The risk of alteration is particularly great for badly refined low-boiling spirits which leave a residue on evaporation. The test for stability is to evaporate 00 c.c. of a six-months-old specimen on the water bath; not more than 50 mgm. of residue should remain.

Freedom From Dirt

Notwithstanding the fact that fuel systems on all engines are fitted with devices for separating water and dirt, motor fuels must be perfectly clean on account of the great sensitivity of the carburetor and fuel pumps to these impurities. Water and dirt, with rare exceptions, separate out on standing, so that dirt separation must rest rather with the carbureting systems than with fuel. As rust formation and water separation are practically unavoidable (both benzine and benzol dissolve small amounts of water), suitable devices must be fitted to deal with them. Alcohol mixtures deposit no water but the dirt chokes the filter so that special care is necessary in designing suitable cleaning devices for these fuels.

Certain fuels have a pronounced odor which is objectionable to many people. This applies not only to the fuel itself, when an unpleasant odor is usually due to poor refining, but also to products produced by incomplete combustion due to over-rich mixture or other causes. For example, partially burnt tetralin affects the eyes and has an unpleasant odor, while benzines with heavy "tails," many cracked benzines and low boiling lignite distillates all tend to burn badly and impart a pentrating and objectionable odor to the exhaust. The exhaust gases from Diesel engines running on gas oils have an irritating effect on the mucous membrane owing to the presence of traces of some product resulting from incomplete combustion, a nuisance which can be overcome by injecting water or alcohol into the cylinder with the fuel, or better by ensuring complete combustion as in the Junkers opposed piston engines. Unless steps are taken the unpleasant odor may inconvenience passengers or contaminate delicate goods such as food, while the exhaust gases pollute the street air.

Toxicity

All low boiling fuels in the form of their vapors exert a suffocating effect on animal life. In smaller concentrations the effect is narcotic; the order of their activity is benzine, benzol and alcohol.

On the other hand, exhaust gases are poisonous owing to the presence of carbon monoxide, again resulting from incomplete combustion. As indicated above, the presence of alcohol in the fuel promotes combustion while high boiling "tails" and high carbon contents favor incomplete combustion. Attempts to overcome these effects have been made by the use of a catalytic process of afterburning, but apparently so far with little success.

The presence of lead tetraethyl in the fuel renders it toxic and such fuels are, therefore, colored red to avoid mistakes being made. When using lead-doped fuels, separation of lead in the engine and pollution of the street air are unavoidable. Owing to medical assertions that lead poisoning is cumulative, the introduction of lead tetraethyl into Germany is difficult, although on account of its technical inferiority to iron carbonyl this occasions no inconvenience.

Skin Irritation

Motor fuels act on the skin by dissolving out the fat, which in the case of certain individuals, gives rise to skin irritation. Benzine and gas oil give little trouble in this respect but coal tar oils and tetralin are particularly potent and cause inflammation or eczema.

The varnishes of the linseed oil type, which it is customary to employ on automotive engines, are generally little affected by benzine or gas oil although more so by benzol and coal tar oils; they are, however, readily attacked by alcoholic mixtures, tetralin, etc. The same applies in a lesser degree to the cellulose paints, although for all practical purposes these remain unattacked. Until, however, the use of cellulose lacquers becomes general, attention must be paid to the solvent action of fuels on varnishes.

Miscibility

Hydrocarbon fuels, i.e., benzine, benzol, gas oil, coal tar oils, lignite oils, etc., are miscible in all proportions inter se. Anhydrous (absolute) alcohol is also completely miscible with hydrocarbon fuels but this property disappears on the addition of water, for example, by absorption from the atmosphere. It is therefore, necessary to add certain substances such as hydrogenated phenols or higher alcohols which have the property of rendering aqueous alcohol and benzine miscible, to prevent separation occurring. These substances are known as "Homogenisers."

Fuels intended for automotive engines must show no tendency to solidify or seperate into their constituents when cooled to 15 to 25 degrees Centigrade, while aircraft fuels must stand much more rigorous cooling without alteration. Benzine is completely unaffected by cooling while gas oil shows only an increased viscosity. On the other hand, coal tar distillates tend to solidify through the separation of naphthalene, etc., and benzol itself freezes at 4 degrees Centigrade. The freezing point of the latter substance is considerably lowered by the presence of its homologues (B.V. type) although benzol tends to separate out at 15 degrees Centigrade. Alcohol and benzine produce a still more marked effect on its freezing point. Alcohol alone or mixed with hydrocarbons, can be cooled to extremely low temperatures without change, but the presence of a little water renders alcohol-hydrocarbon fuels very sensitive to cooling. Benzine-alcohol mixtures are much more sensitive than the corresponding benzol-alcohol fuels. This sensitivity is reduced by the so-called "Homogenisers" (vide supra).

Sensitivity to Water

Benzine is capable of dissolving a small quantity of water, the amount increasing with rise in temperature. The same holds to a greater extent for benzol, with the result that if benzol saturated with water is mixed with benzine, water at once separates. In practice, the separated water tends to collect impurities present in suspension such as rust, etc. These accumulate at the boundary between the two layers, a circumstance which allows the dirt to be drawn off with the water in the form of a sludge. Alcohol mixtures may dissolve several per cent of water with the result that eventually separation into two layers occurs. The number of cubic centimeters of water which causes permanent turbidity in 100 c.c. of an alcoholic fuel

(Continued on Page 128)

35 CENTS a line first insertion; 25c a line each additional insertion. Cash in advance.

CLASSIFIED WANTS

CREATE AND BUILD BUSINESS

MAIL your advertisement now. It will be published next week. Cash with order.

FOR SALE—EQUIPMENT

TANK CARS

50—80,000-gallon 80,000-lb. capacity. Class 2, all steel, with coils.

STORAGE TANKS

2—55,000-bbl., now dismantled. Ready for shipment from East St. Louis.

HYMAN-MICHAELS COMPANY

Peoples Gas Bldg., Chicago, Ill.
Railway Exchange, St. Louis, Mo.

55,000-BBL. brand new tank, $5,000. 7—500-gallon, 3-compartment truck tanks. Only sample of many bargains.
OIL ENGINES
All sizes and kinds—new and used.
What do you need?
Send for bulletin.
ZELNICKER IN ST. LOUIS
Specialists in Rails, Equipment, Tanks, Steel Sheet Piling for 30 Years

---

USED LINE PIPE AND CASING FOR SALE
450′ 15½″ 70-lb. used casing.
1,000′ 12½″ 50-lb. used casing.
2,200′ 10 ″ 40-lb. used casing.
2,100′ 8¼″ 32-lb. used casing.
3,900′ 6⅝″ 24-lb. used casing.
Located in Oklahoma.
Above pipe was purchased new and used in one well.
KEYSTONE PIPE AND SUPPLY CO.
607 Holmes Bldg.
Fort Worth, Texas.

FOR SALE—One 2,000 pound Niles, Bement & Pond Steam Hammer. Used one year.
One 70 HP commercial stationary boiler, including bricks and stack.
Larkin Packer Co.
St. Louis, Mo.

NOTICE
For sale, Wilson Refinery equipment, tanks, still, pumps, agitator, boiler and pipe and connections. Was running this year. In A-1 condition.
W. BOGART
Burkburnett, Texas Phone 136

FOR SALE
Two strings second-hand standard drilling tools, located Oakhurst, Okla. Bargain. Address P. O. Box 862, Tulsa.

FOR SALE CHEAP
2—150 H.P. Bruce McBeth gas engines.
1—165 H.P. Bessemer Gas Engine.
1—125 H.P. Bessemer Gas Engine.
1—110 H.P. Bessemer Gas Engine.
2—80 H.P. Clark direct connected engine compressors.
ACME EQUIPMENT COMPANY,
207 Fulton Bldg., Pittsburgh, Pa.

NEW DRILLING TOOLS—BARGAIN FOR QUICK SALE
10 Strings Cleaning Out or Drilling Tools, viz:
(3½″×29′ Stem) (Jars 4½″) (Bits 2—200 lb. E. 5⅞″) (Babcock Wire Line Sockets) Joints 2×3×7.
If you want some A-1 small Tools at a big bargain, write or phone. ROGERS IRON WORKS COMPANY, JOPLIN, MISSOURI.

FOR SALE—Photostat Business in San Angelo, well equipped plant showing profit each month. Owner has out-of-town interest to look after. Write or see Marvin Henderson, 1 New Findlater Bldg., San Angelo, Tex.

FOR SALE OIL LAND by owner nearly four miles from WARD COUNTY. Discovery producer Hazlett Section 17, block 5, H.&T.C., near Crane-Ward County line; my section 18, block B-28, H.&T.C., Crane County, Texas. Make offer for land in fee or royalty, part cash and part oil. Address or wire Jefferson Smith, 4009 Ave. G., Austin, Tex.

FOR SALE, One 12 HP single cylinder Cook gasoline drilling engine, also one string of light six-inch tools. A. D. Fasnacht, R. D. 4, Massillon, Ohio.

FOR SALE—EQUIPMENT

LIQUIDATION SPECIALS OF WAYNE WOOD PRODUCTS CO.
COLLINWOOD, TENN.
5—150 H. P. H. R. T. 150 lb. Boilers, complete.
2—38″ all Copper Distilling Columns.
40—Retort Condensers.
2—Allis-Chalmers 500 KVA Generators, 480 volt, 3 phase, 60 cycles, direct connected to Nordberg Unaflow Steam Engines, complete with switchboard, exciters, etc.
1—Baldwin 60 ton and 1—Porter 45 ton standard gauge Steam Locomotives.
4—20,000 Gallon Horizontal Steel Storage Tanks.
30—Miscellaneous Tanks, 3,000 to 6,000 gallons.
Send for complete booklet listing Pumps, Motors, Stills, Tools, Air Compressors, Building material.
CONSOLIDATED PRODUCTS CO., INC.
17-20 Park Row, N. Y. C. Barclay 0600

We are in the market for all sizes pipe and casing.
We have on hand, all sizes pipe and casing.
You must be satisfied.

Imperial Pipe & Threading Co.
Box 1231 Wichita Falls, Texas

EQUIPMENT WANTED

8,000 GALLON COMPARTMENT Tank Car.
Give full description.
ZELNICKER in St. Louis.

HUGHES CORE DRILL, 6¼ in., wanted. Rent or buy second handed. Semte Oil Co., Box 558, Jackson, Tenn.

BUSINESS OPPORTUNITIES

OIL INVESTMENT

We offer an opportunity to investors, oil producers and oil companies to participate in the drilling of a well in practically proven field where the oil is of extremely high gravity and gasoline content running up to 70 per cent natural. This organization is capitalized at a small number of interests and a $100 put into it might yield to you wonderful returns. A good clean proposition that will stand up under rigid investigation. Every answer to this advertisement will receive prompt attention and maps and full particulars will be sent you at once. Address Box C-599, The Oil and Gas Journal, Tulsa, Okla.

CAPITAL SEEKERS—Put your project before 260 livewire brokers—cost trifling. Details free. Amster Leonard, East Orange, N. J.

WE BUY, or Refinance Gas, Oil or Pipe Line Companies with assets of One Million Dollars, or more. Address: P. J. Minck, Tulsa, Okla. Phone 4-0245.

WILL GIVE INTEREST in good proposition for drilling a shallow well. B. L. Anthony, 909 E. Pine, Enid, Okla.

FOR SALE—Choice Ranch 10,000 acres; well stocked; good buildings; also Leases in Culbertson, Loving and Minard Counties. L. R. Van Akin, Minard, Tex.

4,300 acres to trade for test well. Fourteen miles north of Ft. Smith, Ark. Box C-662, The Oil and Gas Journal, Tulsa, Okla.

TRADE BY OWNER well located beautiful modern home in St. Petersburg, Florida, for Star rig No. 30 with all tools and 3,000 ft. casing. R. H. Smith, 611 Union Nat. Bank Bldg., Wichita, Kans.

HAVE 250 BARRELS high gravity settled production and 300 acres of proven with drilling equipment and organization. Will put in as nucleus for building larger company or consider merger with parties having similar proposition. Box C-671, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE—PETS

Well trained setter dog, 5 years old, good on birds and ducks. Box 91, Dublin, Texas.

POSITIONS WANTED

CORING EXPERT just returning from India where he has been employed as service operator for large core drill manufacturer, offers his services. Speaks Spanish and Portuguese. Willing to go anywhere. Tor O. Sjobom, 1611 Rose Street, Berkeley, Calif.

HAVE YOU A PLACE for a capable man in your company who is not afraid of hard work and long hours? Have had 12 years' experience in developing and handling oil and gas properties. Thoroughly familiar with drilling tools, producing leases, dewatering and care of gas wells, etc. Have good reason for desiring change. References furnished. Salary reasonable. Box C-655, The Oil and Gas Journal, Tulsa, Okla.

GEOLOGIST of wide experience in domestic and foreign fields desires permanent connection. Box C-658, The Oil and Gas Journal, Tulsa, Okla.

WANTED position as oil field machine shop foreman, long years experience and thoroughly capable. Also would consider position as Supt. of air compressor station, thoroughly familiar with installation and operation of all makes air compressors, oil and gas engines. Desirous of making change in location. Address, Arch F. Miller, Box 593, Norphlett, Ark.

ADVERTISING RATES

	1 Time	2 Times	3 Times	1 Mo.
3 lines	1.05	1.80	2.25	3.30
4 lines	1.40	2.40	3.40	4.40
5 lines	1.75	3.00	4.25	5.50
6 lines	2.10	3.60	5.10	6.60
7 lines	2.45	4.20	5.95	7.70
8 lines	2.80	4.80	6.80	8.80
9 lines	3.15	5.40	7.65	9.90
10 lines	3.50	6.00	8.50	11.00

(Six words usually make a line.)
Compute white space at the above rates.
Mail your advertisement to

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

EXPERIENCED FIELD MAN
Twenty-five years experience, Mid-Continent, Eastern and Foreign fields, development, production leasing and geological. All branches, including executive. Desire position with company or individual operator. Can handle any field position. References, Salary or salary and interest. Interview desired. Box C-668, The Oil and Gas Journal, Tulsa, Okla.

Refinery Engineer Superintendent technical graduate fifteen years experience. Can design, build and operate pipe and cracking stills. Would like take charge medium sized plant. Box C-666, The Oil and Gas Journal, Tulsa, Okla.

DRAFTSMAN: Two years experience on air lift and gas lift plants. Also several years architectural work. Box C-665, The Oil and Gas Journal, Tulsa, Okla.

EXPERIENCED GEOPHYSICAL AND SEISMOLOGIST desires connection with company organizing geophysical department. Will consider foreign work. References and detail on request. Box C-667, The Oil and Gas Journal, Tulsa, Okla.

ENGINEER with 10 years experience covering production methods, refinery design, construction, operation and maintenance, desires position as Purchasing Agent, Construction or Maintenance Engineer. Box C-664, The Oil and Gas Journal, Tulsa, Okla.

GRADUATE GEOLOGIST, age 23, single, wishes position with oil company. Prefer sub-surface department. Will go any place in U. S. Willing to take small salary to start. Best references. Write or wire, Box C-660, The Oil and Gas Journal, Tulsa, Okla.

Young man, 25, desires position in foreign country, good education, six yrs. business experience. Box C-663, The Oil and Gas Journal, Tulsa, Okla.

HELP WANTED

DRAFTSMEN

WE REQUIRE SEVERAL THOROUGHLY EXPERIENCED DRAFTSMEN IN OUR OIL REFINERY DEPARTMENT, CAPABLE OF DESIGNING THE EQUIPMENT FOR PIPE STILL DISTILLATION UNITS, SUCH AS THE STILL, FRACTIONATING TOWERS, PUMP HOUSE, PIPING, ETC. OPPORTUNITY FOR ADVANCEMENT. GIVE COMPLETE DETAILS IN YOUR APPLICATION, AGE, PAST EXPERIENCE, SALARY AND WHEN AVAILABLE.

ARTHUR G. McKEE AND CO.
2422 EUCLID AVENUE
CLEVELAND, OHIO.

WANTED: PATENT LAWER OR TECHNOLOGIST
Want services of patent lawyer or technologist to study oil cracking processes with particular reference to patent claims. Some previous knowledge of oil cracking patents required. Box C-654, The Oil and Gas Journal, Tulsa, Okla.

WANT MAN between 22 and 30 who is, or has been, stenographer or assistant to sales manager of oil refinery company with knowledge of shipping, billing and traffic. Must be good stenographer. Reasonable salary; advancement to competent man. Give all particulars confidentially and salary required. Location Oklahoma City. Box C-653, The Oil and Gas Journal, Tulsa, Okla.

RESEARCH CHEMIST, experienced in natural gasoline and gas analysis and capable of effecting and maintaining chemical and physical control in gasoline plants. Permanent work in Oklahoma. Answer in own handwriting, giving education, experience, references and salary expected. Box C-651, The Oil and Gas Journal, Tulsa, Okla.

EXPERIENCED ESTIMATOR WANTED. Familiar with materials and manufacturing costs involved in the construction of distilling and condensing equipment for the petroleum industry. Box C-657, The Oil and Gas Journal, Tulsa, Okla.

WANTED EXPERIENCED RESEARCH CHEMIST by an old established and completely rounded out oil company. Submit by letter complete history and qualifications. Box C-656, The Oil and Gas Journal, Tulsa, Okla.

Refinery construction engineer for work in Louisiana. Must be capable of assuming full charge of maintenance and new construction of 5,000-bbl. plant. Salary $275.00 per month. In answering state age and experience. Box C-661, The Oil and Gas Journal, Tulsa, Okla.

WANTED: Chemist with plant or laboratory experience in lubricating oil manufacture. Submit complete details of experience and personal history in reply. Address Box C-669, The Oil and Gas Journal, Tulsa, Okla.

Electric Welders experienced, for work 600 miles 12-inch pipe line from Fort Arthur to Monahans. Welders now making from $11.00 to $14.00 per day. Make written application to Smith Brothers, Inc., 807 Littlefield Building, Austin, Texas.

Graduate engineer with at least 2 years gasoline plant and other oil field experience, for sales work in South America. Must be single. State age, salary desired, and past experience. Box C-670, The Oil and Gas Journal, Tulsa, Okla.

REAL ESTATE

CALIFORNIA FARM, HOMESITES overlooking Pacific North of Los Angeles. Crops earn $300 per acre. A. M. Rainey, owner, R. F. D. 501, Oxnard, Calif.

RANCHES AND FARM LANDS

40,000 ACRES
Stocked, ample pastures, house, etc. Marfa Country, much game, $2.56 per acre bonus, (no lease). Also 250,000 acres in Mexico, 36 cents. Redus Land Co., San Antonio, Tex.

35 CENTS a line first insertion; 25c a line each additional insertion. Cash in advance.

CLASSIFIED WANTS

CREATE AND BUILD BUSINESS

MAIL your advertisement now. It will be published next week. Cash with order.

ROYALTIES—PRODUCTION

PRODUCING and CLOSE-IN royalties, some fine buys available, small and large, in older fields and West Texas. Write for list "P." National P. & R. Co., Wichita Falls, Tex.

PERPETUAL DEEDED ROYALTIES Winkler, Loving, Ward, Lea, Pecos Counties. J. R. Haynes, Grantville, Kans.

UNDEVELOPED OKLAHOMA ROYALTIES, favorable districts. Joe P. Crawford, Petroleum Bldg., Oklahoma City, Okla.

I WILL SELL ½ of ¼ royalty of 4-10-7 of 40 Acres Seminole Co. and ½ of ¼ royalty of 6-7-2 of 40 Acres Pottawatomie County. John Hinton Hoppes. Washington C. H., Ohio.

ROYALTY AND LEASE BARGAINS
Logan County, Oklahoma.
Pennock & Pennock, Guthrie, Okla.

80 ACRES ROYALTY $5 to $20 in one to four interesting West Texas locations. Resale service, drilling bulletins, new locations reports. NATIONAL ROYALTIES, Box 1214-B, Wichita Falls, Texas.

LAND OWNER WILL SELL 1/12 of ½ of his ⅛ royalty on 240 acres now fully 1 location (in 3 places) from good producers (next wells being offsets) and apparently in direct trend. For map, price, information, address P. O. Box 88, Wichita, Kans.

LEASES—PRODUCTION

WRITE for our list; oil leases, royalties and blocks; Pontotoc, Seminole and adjoining counties. Bowles & Smith, Ada, Okla.

FOR SALE — Leases, Oil Production, Asphalt, Limestone and Other Mineral Lands W. P. Harley, Bowling Green, Ky.

WANTED AGENTS AND BROKERS We are drilling on what looks like one of the best chances for oil and gas in Louisiana between Sorrento-Salt Dome on the east, and the Belle-Helene Salt Dome on the west, with production on both sides of us. Big development is going on on both sides by the Major Oil Company, and Independent Oil Corporation. This is one of the big oil chances in the southeast Louisiana, Asansion Parish. Write for maps and geological reports.
BURNSIDE OIL COMPANY, INC.
611 Mariatine Bldg.,
New Orleans, La.

DO YOU WANT AN OIL FIELD? I will sell you 40 or 80 acres offsetting production in Milam County, Texas, along the Balcones Fault, surrounded by production, for $25 per acre providing drilling is done immediately. Will drill and equip as many wells as desired for $800 each to 300 foot sand producing 6 to 15 bbls. flush, deeper possibilities up to 3 shers below 3,000 feet. Will care for properties on percentage basis indefinite- and contract oil at 25c per bbl. bonus above posted prices. WILL GUARANTEE COMMERCIAL PRODUCTION. Act quickly, full information furnished. C. L. STRATTON, 2104 Fort Worth Nat'l Bank Bldg., Ft. Worth, Texas.

LEASE AND ROYALTY SNAP. WELLS GOING DOWN ON EVERY SIDE DESTINED TO BE NEXT GREAT OIL CENTER OF OKLAHOMA. Box 204, Waynoka, Okla.

Selling few 32nd interests in well to be drilled and 485 acres close in, in new Ohio shallow gas field with real gas market. Write for particulars. Box 972, The Oil and Gas Journal, Tulsa, Okla.

Shale gas a conservative investment. We will sell six ⅛ interests in lease in Kansas gas area for the sum of $500.00 each; or portion of an eighth on same basis. Will drill and fully equip five wells, as interests are sold. Address Room 211, Hotel Booth, Independence, Kans.

OIL LEASE, ROYALTIES, RANCHES South-West Texas. Winkler, Loving, Ward, Reeves, Culberson Counties.
H. F. ANTHONY & CO.
Pecos, Texas.

LEASES—PRODUCTION

LEA COUNTY, NEW MEXICO
Perpetual Royalties.
W. S. Patterson,
Pecos, Texas.

FOR LEASE—880 acres. 10 year contract 50 cents rental. Township 11 South, Range 37 East, Lea County, New Mexico. Well going down within four miles. Will sell ½ of ⅛ royalty on 1,000 acres, or more. Address, J. R. Webb, Portales, New Mexico.

NEW YORK CITY

OIL LEASE BROKERS

I WOULD LIKE THE NAME, ADDRESS AND TELEPHONE NUMBER OF, OIL LEASE BROKERS OF EXPERIENCE IN NEW YORK CITY WHO WOULD BE INTERESTED IN SELLING LARGE BLOCKS OF MICHIGAN OIL LEASE ACREAGE OR OTHER ACREAGE OF MERIT.

LEE SMITH
P. O. Box 207
Niles, Ohio.

HAVE 5,000 ACRES in south part of DeWitt County, Texas, this 5,000 acres adjoins The Texas Company block, also the Roxana Petroleum Corporation's block in Dewitt County. This 5,000-acre block is all new 10-year leases, and carry a $1 per acre rental each year. I will sell a few 50 to 100-acre tracts out of the 5,000 acres for $3 per acre. This part of DeWitt County is now getting a big play by all major companies. Now is the time to get protection for South Texas commercial leases and drilling contracts around the two blocks. Address P. L. Tindle, Goliad, Texas.

Owner will lease 2,000 acres solid body Colorado Co., Texas, active territory, (See The Oil and Gas Journal, November 1, page 51) for 2,000-foot test or ten thousand cash, one eighth royalty. Texas University Bulletin 2,333 page 149 says most promising district in county. Almost surrounded by leases to large companies. Box 961, Houston, Tex.

MICHIGAN LEASES
FOR SALE 2,000 acres leases in Ingram County, Mich. Price $1.00 per acre. Also block leases in new Ohio shallow gas field. J. H. Harmon, 14 Massa Ave., Mansfield, Ohio.

FOR SALE OR LEASE
OKLAHOMA
10 acres Atoka county, Sec. 9-4s-13e.
10 acres Sequayoh county, Sec. 20-13-26.
10 acres Cherokee county, Sec. 11-19n-21e.
5 acres Pittsburgh county, Sec. 17-3n-17e.
$10 per acre. J. C. Barry, owner, 3574 Eleventh St., NW, Washington, D. C.

WANTED AGENTS AND BROKERS WE ARE DRILLING on 6,000 acres. One of the best chances for oil and gas in Louisiana. Between Sorrento Salt Dome on east and Belle-Helene Salt Dome on west, in Ascension Parish. Just west of the Gulf Refining Co.'s 10,000 barrel GUSHER at McElroy. Big development on all sides by major and independent oil companies. This is one of the big oil chances in southeast Louisiana. Write for maps and full information.
BURNSIDE OIL COMPANY, INC.
611 Maritime Bldg., New Orleans, La.

NEW MEXICO — Lease in Lea and Roosevelt; cheap royalties in Roosevelt and Guadalupe; leases in any county; information regarding New Mexico developments. William U. Tate, Franciscan Hotel, Albuquerque, N. Mex.

$3 TO $5 per acre for West Texas land with Oil and Mineral rights 40 acres up. New Mexico oil leases. Winter garden lots and truck farms on easy terms; agents wanted. A. Poe, 829 Wilson Bldg., Dallas, Texas.

LEASES—PRODUCTION

ATTENTION, brokers and investors: Write for our list of oil leases and oil royalties in Pontotoc, Seminole and adjoining counties. Bowles and Smith, First National Bank Bldg., Ada, Okla. Phone LD35.

FOR SALE—All or part interest in 3 new wells in new shallow territory. 600 ft. deep. Bartlesville sand. Three wells flush exceed 60-bbl. Come and inspect this real opportunity. M. H. Brown, 600 Peoria St., Paola, Kans.

A UNIQUE SCOUT SERVICE offered; a big play is impending in Mississippi and Alabama by major companies and independents; get the information while it is still information; for particulars on reliable and timely reports, write Robert L. Steffey, 401 Edwards Hotel Bldg., Jackson, Miss.

LEA COUNTY, NEW MEXICO, lease, 40 acres section 33, township 17, range 36. James R. Haynes, Grantville, Kansas.

WINKLER—PECOS COUNTIES
Leases and Royalties.
W. S. PATTERSON
Pecos, Texas.

LEASES—PERMITS—UNUSUALLY CHEAP
12—350' wells now producing. More drilling and deeper sands being tested. New Mexico Shallow oil field. W. H. Davis, Box 163, Borger, Texas.

FOR SALE OR LEASE, five hundred acres, Wheeler County, Texas—four hundred acres, Pecos County Texas—three hundred twenty acres, Culberson County, Texas—sixty acres, Reeves County, Texas—thirty seven acres, Pecos County, Texas. Address Post Office Box 1120, Station "C," Los Angeles, California.

WILL BUY New Mexico oil leases. Have for sale perpetual mineral deeds, under Major Oil Company leases, Lea County. Write MONARCH INVESTMENT COMPANY, Roswell, New Mexico.

Inexhaustable Gas Well at 300 Feet
1,500 ACRE BLOCK in Southwest Kansas right against a new Industrial Gas line that is raring for gas, 5 gas stratas 180 to 850 feet, gas production on all sides, Year around market eight cents at wells. No line pressure to buck. Long life sand gas wells and practically no decline to shale or Oswego wells. Almost impossible to drill a dry hole. This is the finest little gas proposition you'll ever see and the block is for sale. Address P. O. Box 533, Bartlesville, Okla.

NEW MEXICO oil leases; Lea, Eddy, Chaves, Union, Quay and all other active counties; complete list and map on request. Orcutt-Harris & Co., Colcord Bldg., Oklahoma City, Okla.

LEASES AND ROYALTIES, Caddo, Blaine and adjoining counties. Write for complete list. A. E. Baldwin, Anadarko, Oklahoma.

INCORPORATIONS

DELAWARE incorporator. Charters, fees small, forms. Charles G. Guyer, 901 Market St., Wilmington, Del.

CHARTERS—Delaware best, quickest, cheapest, most liberal. Free forms. Colonial Charter Co., Wilmington, Del.

PATENT ATTORNEYS

REGISTERED PATENT ATTORNEYS
United States and Canada
Before disclosing your invention to anyone, send for blank form.
Evidence of Conception.
Bulletin "How to Establish Your Rights" and complete information free.
LANCASTER & ALLWINE
240 Ouray Bldg., Washington, D. C.

C. W. GERARD, Registered Patent Attorney; former Patent Office Examiner. 510 Lathrop Bldg., Kansas City, Mo.

PATENTS—Oil well cases a specialty. Reliable services by an experienced practitioner, devoting personal attention to each case. References to oil well clients in Tulsa. B. P. Fishburne, Patent Lawyer, 550 McGill Bldg., Washington, D. C.

MONEY RAISING

COMPANIES organized and financed. Address full details to, Box C-551-A, The Oil and Gas Journal, Tulsa, Okla.

FINANCE YOUR OWN project with shares bonded. Quickest, most satisfactory known method of raising capital. Information free. Bankers Interstate Security, Electric Bldg., Denver, Colo.

DO YO UNEED MONEY for organizing or financing oil or mining deals? Write 136 E. 13th, Oklahoma City, Okla.

CAPITAL SEEKERS
Will endeavor placing proposition of merit on underwriting basis. Box 44, Room 407, 26 Court Street, Brooklyn, N. Y.

GEOLOGISTS

GEOPHYSICAL
Magnetometer surveys made, contour map prepared. Expenses and acreage. GEOPHYSICAL EXPLORATION CO., Petroleum Bldg., Oklahoma City, Okla.

OIL LOCATED before drilling. Geophysical method. Magvibrometer Instrument; take pay in oil. No oil, no pay. Except traveling and testing expenses. 95 per cent accuracy. O. P. Coffin, Caddo, Texas.

VERTICAL MAGNETOMETER SURVEYS
Made and interpreted by F. L. Rookstool, 724 Jenkins, Norman, Okla. Phone 1761.

LOCATING AND DEFINING OIL AND GAS structure which will produce. WANTED, capital interested in wildcat territory. Will lease and locate. D. H. Reavis, Columbia, Tenn.

ADVERTISING RATES

	1 Time	2 Times	3 Times	1 Mo.
3 lines	1.05	1.80	2.25	3.30
4 lines	1.40	2.40	3.40	4.40
5 lines	1.75	3.00	4.25	5.50
6 lines	2.10	3.60	5.10	6.60
7 lines	2.45	4.20	5.95	7.70
8 lines	2.80	4.80	6.80	8.80
9 lines	3.15	5.40	7.65	9.90
10 lines	3.50	6.00	8.50	11.00

(Six words usually make a line.)
Compute white space at the above rates.
Mail your advertisement to

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

OIL INDUSTRY PRINTING

CONSUMERS LEDGERS
We are prepared to furnish from stock standard forms of gas meter Consumers Ledgers. Sample forms and quotations on request. First-class material and workmanship.
DERRICK PUBLISHING CO.
Oil City, Pa.

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township books, well records, etc. Request on your letter head gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

MANUFACTURING MACHINISTS

MACHINE WORK—CASTINGS
Machined to your drawings. Gears, Machinery designed and built.
Modern Facilities—Prompt Service.
Reasonable prices. Send for our booklet.
GENERAL ENGINEERING AND MFG. CO., ST. LOUIS, Mo.

WANTED

WANT PARTNER to drill 2,700 acres; close to production; sale of half will pay for well; will have to post $15,000; 3,500 feet. Wm. Haver, 916 Brown Bldg., Wichita, Kans.

WANTED
Semiproven or proven acreage. Eastern capital will consider developing semiproven or proven acreage in Mid-Continent Field with or without production. Give full description. Address Advertiser, 978 Drexel Bldg., Philadelphia, Pa.

Chicago Movement Mostly on Contract

Gasoline Prices Above Views of Buyers. Distillate Orders Growing. Inquiry for Low Sulphur Fuel Oil

By J. B. Waldo

CHICAGO, Nov. 19.—The large gasoline movement in this market today was on contracts. There were quite a number of spot orders, but for the most part these were for small amounts. The larger refiners were asking spot buyers 9¼ cents for U. S. Motor gasoline, and this was above the views of those buyers, who placed most of the spot business with other refiners either direct or through marketers. The bulk of the U. S. Motor business went at 8¾ cents, with the price shaded to larger buyers to 8⅝ cents. This was for good Oklahoma material. Gasoline from West Texas was offered at materially lower prices. The 56-58 with a 437 endpoint was quoted for resale at 8 to 8¼ cents, and this material possibly accounts for some of the very low quotations which jobbers report are being made them. There was little doing in the higher gravities on Monday, although a better demand is anticipated if, as seems possible, colder weather is at hand.

Kerosene Drags

Kerosene dragged along with little demand in this market, although an occasional exception was found to the rule of little or no business. Distillates continued to be ordered both on contract and in the spot market. Some of the distributors are adding to the number of cars called for by their contracts. Prices were strong for the good odor oil. Some of the distributors inquired regarding gas oil, wanting straw color as a substitute for distillate if the price of the latter advances materially. This product is also strongly held.

There was a fair demand for industrial gas and fuel oils, and the prices were unchanged, refiners holding for previous prices. One of the larger refiners offered a considerable number of cars of low sulphur fuel oil late last week, selling at 60 cents for the 18-20 gravity. This refiner seldom has fuel oil to offer outside of its regular trade. There is considerable inquiry for the low sulphur fuels with a low viscosity and cold test. Snow was reported today from many parts of the territory, and should it be followed by freezing weather the demand for the heating oils is expected to show a good increase, but slippery roads may decrease the use of autos and limit gasoline sales. However, there is no assurance that cold weather will follow so early in the season.

Reduction Unsettles

Last week was not a very good one in the Chicago oil market. The reduction of one-fourth cent a gallon in refinery price made by the leading refiners had a decidedly unsettling influence. There was a general revision of gasoline prices and the final result was that those who had been selling at less than the price held by the leading refiners were still below that new price and still getting the major part of the spot business. Several sales managers admit their spot sales have not been increased by the price reduction and state that any price cut made will not increase their spot business unless the reduction be so drastic it would almost force a tank wagon decline which would be most unfortunate if not actually disastrous. "Whatever the price we make," said one sales manager, "these other sellers will still keep under our price just so long as they want the business, and there is little enough business right now for any refiner outside of his regular customers who are bound by a contract."

While it is true quite a number of distributors who had always been spot market buyers signed contracts last summer and during the early fall, there are also many, possibly an equal number, who do not consider the contracts offered to them as giving them any real protection nor a sufficient margin and these have turned for their supplies to the spot market. From many of the gasoline sellers of all classes last week, there was comment on the way buyers were shopping around for the lowest price and the hand-to-mouth manner in which they placed orders. There was also some comment on the feeling displayed by some of these dealers towards refiners.

Since the consumption of gasoline has begun to show its seasonable decline, there has been more and more price cutting until the situation is admittedly bad in some important parts of the territory. Indiana is one of the worst in parts but there are other sections almost as badly cut. The action of the major companies has been to reduce the service station price to the tank wagon price but this has not proved successful in many points in forcing a return in price while it does penalize the dealers who have not cut their price. The originator of the trouble may lose some of the gallonage he expected to gain by his price reduction but he is otherwise no worse off than those dealers who have maintained the full price until the major companies took action. And in those towns where there is a price cutter and where the major companies have not acted the other dealers are afraid of what may come and are helpless. It is a bad situation which goes back of the mere question of the price at which the motorist may be able to buy his gasoline.

New Plan in East

The Standard companies in the New Jersey and Ohio territories have announced a new plan of pricing at their stations and the tank wagon. The statement is that all discounts and allowances have been recalled and will not be given either to consumers or dealers. A fixed price at the stations is made for any quantity and the dealers' price, that is the tank wagon price, is 3 cents below the station price. This is the same discount allowed on quantities of 6,000 gallons or more in the Standard of Indiana territory by the major companies. The eastern companies do not make any quantity restriction, the 3 cents spread applies to all purchases. This is a simple way of pricing and will do away with much confusion. Probably in the long run the refiners will make just as much money and the dealers will do a little better and neither will have so much bookkeeping to do.

Price Situation

There was really little change in the gasoline situation last week. The consumption has been reduced to some extent by wet weather but generally it is good for the season. Orders against contracts were freely made and there is little or no complaint regarding the taking of their quotas by dealers. Those distributors not supplied on contracts bought just what they had to and sought painstakingly for the lowest possible price. This price with the larger refiners was 9¼ cents for the U. S. Motor grade, the product in best demand. The higher tests did a little better, the best business coming from the Northwest where winter comes early. The prices of the higher gravities were uneven, quotations ranging from 10¼ to 10¾ cents for 64-66—375 endpoint to the spot buyer with the bulk of the sales at the lower price, occasionally shaded. The antiknock gasolines are cutting into the sale of the high tests. One reason for the variations in the prices is due to the fact that not all of the larger refiners run anything higher than a 58-60 gravity and purchase what they actually must have to supply the demand for the higher tests. They admit their prices are often out of line for these products.

Spot Market

The spot market as quoted by some refiners, usually the smaller ones, was just about one-quarter cent below the price for U. S. Motor gasoline named by the larger group. The jobbers were freely quoted 9 cents and sales were made as low as 8¾ cents. Marketers were offered U. S. Motor gasoline out of Oklahoma and North Texas at 8½ cents over the balance of the month. Few purchases were made for more than immediate needs or to cover sales as the feeling was that there would be no advance. If any change was made it would be to lower costs. There are reports circulated that there are beginning to be considerable accumulations of gasoline at several plants. However, the refiners state their stocks are low and they are willing to increase their supplies in storage provided the increase is not too large nor too quickly made. To guard against this condition, refiners here declare crude runs will be reduced when necessary. There was no good news out of the differential territories to the east. The competition continues very keen and in Ohio and eastern Indiana the prices quoted by sellers of gasoline of southern origin which are favored by freight rates, are below 8½ cents on a Group 3 basis. The Standard Oil Co. of Ohio has been quoting 12¼ cents delivered anywhere in the State but buyers report prices have been made of 11½ cents delivery at Cincinnati and of 12 cents delivery at Cleveland.

Exporters state there are a number of inquiries in the market from foreign sources but little of this business can be secured as the California refiners are moving their gasoline at low prices. California gasoline has been offered, delivery at Gulf Ports, at less than the cost of Mid-Continent gasoline delivered at these points and of course they are quoting correspondingly low prices direct to the foreign buyers. Natural gasoline has been quiet here. Prices have moved upward and downward fractionally.

Kerosene and Distillates

Kerosene has simply moved along slowly with little domestic demand and practically no movement of any importance. Most of the larger refiners hold for 6 cents with an occasional quotation of 5⅞ cents on the 41-43 gravity. Smaller refiners have sold direct at 5⅝ cents. There is only a light inquiry for the 42-44 gravity.

Distillates continue to move quite actively although there is no real rush. The consumption is now quite steady if not as large as it will be later. The bulk of the movement is against contracts, but there is considerable buying in the spot market by smaller distributors whose storage is limited. Statements made by the distributors indicate the distillate demand is really considerably larger than it was a year ago. Right now it is the most active product, not in volume but in inquiries, and number of sales made. The usual price quoted for a really desirable 38-40 distillate is 3½ cents. Some can be bought for a little less but some of this lower priced material is not so desirable and some of it will only breed trouble as the odor has not been fully removed. There are several large refiners who have sold their entire output for the season, and in each case the product is of better than average grade possessing the qualities which make a useful furnace oil. Some is better than the rest, but it is all good. There are some jobbers who do not sense the fact that a distillate or any domestic burner oil requires the most careful handling if the business is to prosper and the demand grow. The large distributors use extreme care to furnish an oil against which no reasonable complaint can be made.

Gas Oil Dull

The demand for gas oil was dull last week. The common grade of industrial gas oil moved slowly. The gas company oil grading a little better than the common industrial oil was selling largely on contracts at fixed prices. There was only a fair demand in the spot market and the price was still 2⅝ cents to large buyers. There were some slight shadings made to secure wanted business but that was the going price for U.G.I. oil in quantities. Smaller buyers of this grade paid in some cases 2½ cents. In the zero oil there was still considerable hesitation shown by buyers. The large demand for this oil is for heating purposes and the lack of low temperature is blamed for lack of an active demand. There was no change in prices for any grade, but the oils suitable for domestic oil heaters were firmly held while the industrial qualities were less strong.

Fuel Oil Unchanged

One of the peculiar conditions in the fuel oil situation is the absence of any change. Usually such a long period of comparative inaction has resulted in some decisive effort on the part of refiners to move their product. This season the have pegged their prices and are holding them. One refiner with a considerable production of a desirable 24-26 fuel oil save that the cold test is around 30 degrees stated several weeks ago that the oil was worth 60 cents if it was worth a nickel and that they should hold the price. The price is holding in spite of the earnest efforts of buyers. Another large refiner with a lot of 18-22 oil, but sulphur high is refusing every day a large amount of business at less than 50 cents. Possibly the business could any way, but the refiner could book a lot of orders ahead if the price could be shaded. And right through the list of refiners, there is or seems to be a real feeling that fuel oil is worth a price and the way to get that price is to hold to it. Once the buyers feel sure the price is fixed they will buy what they must have and lowering the price will not increase consumption. There is just about as much consumption. Price cutting, just like any other sales promotion effort does not do anything but secure a larger share of a determined quantity. Some one secures a smaller share than expected and the next time an opportunity offers, that one will try to secure the larger share. The demand for fuel oil is moderate and quite steady, no big buying, no great amount of anticipation. The railroads have not been taking the fuel oil freely, but some are doing better. Manufacturing plants are buying very conservatively. Their consumption is very good as a whole, a regular steady movement. The higher gravities especially the oil low in sulphur and with a low cold test and viscosity are holding their own, perhaps a little better while waiting for the larger demand. But the heavy fuels the supply is larger than the demand apparently for some time. In addition to the heavy fuel oil shipped directly from West Texas plants there is a great volume of fuel oil sold by refiners outside of West Texas, running on West Texas crude. A prominent oil man who recently visited West Texas said he was surprised at the avidity with which the large organizations were buying this crude and shipping it to their plants by tank car, trainloads leaving the fields each day. The new freight rates on shipments from West Texas went into effect on November 12 but as

(Continued on Page 129)

Softer Undertone to Gasoline in East

Tank Car Market Continues to Hold at 11 Cents. Consumption Maintained at High Level. Fuel Oil Market Outlook Better

By Special Correspondent

NEW YORK, Nov. 19.—Gasoline has developed a softer undertone in the East Coast area this week, although the tank car market continues to hold at 11 cents, and is being maintained at that level by the principal refiners in this territory. Lubricating oils again worked into higher ground during the week, with steady to firm markets ruling on paraffin wax, petrolatum, Diesel oil, gas oil, and fuel oil. Kerosene is likewise well maintained.

Interest has centered a good deal this week in the new marketing policy announced by the Standard Oil Co. of New Jersey, to become effective November 21. This policy, establishing a definite, or "true" tank wagon quotation, with the elimination of all discounts to commercial users, distributors, etc., clarifies the tank wagon situation to a considerable degree. It is expected that this action will mark the first open step by prominent oil companies in the East to stabilize their marketing operations, and that other leading companies operating in the area will clarify their policies in similar fashion. Most of the large refining and marketing interests in the East Coast zone have made numerous changes in their marketing operations this year, but these alterations involved the discontinuance of competitive practices which had fallen into disrepute, and were considered strictly a company affair by the companies themselves. The action of Standard Oil of New Jersey in publicly announcing its marketing policy, therefore, is regarded in the light of a wholesome step toward bringing the entire marketing situation out into the open.

Tank Car Markets

The quotation of 11 cents a gallon on U. S. Motor gasoline holds in the East. Reports of sales going through at 10¾ cents a gallon are more frequent, but thus far it does not appear that any of the more prominent factors in the situation here has gone under the 11-cent level. Jobbers, however, are appreciative regarding the possibility of another reduction, and this is reflected in their buying attitude. Distributors who normally would carry enough gasoline in their storage to carry them through a week are now almost down to a day-to-day basis, and are ordering forward rush shipments of single cars to keep their orders filled. With this state of mind prevailing, it will take a pronounced bullish development to get buying back on a quantity basis.

Refiners contend that current market conditions do not justify any general lowering of the tank car quotation, but concede that conditions beyond their control, notably the competition of outside sellers, may force a downward revision. While business is more on a hand-to-mouth basis, they point out, gallonage has held up well in the aggregate, and with continued favorable weather it is not expected that consumption will show any drastic falling off. While the weather has been too cold for much pleasure motoring, automobiling is no longer as much in the pleasure class as formerly, and barring any heavy storms or spells of extreme cold weather, they look for a well-maintained demand for gasoline right on through the balance of the year. California U. S. Motor gasoline continues to offer at 11 cents a gallon, and some distributors are showing a preference for this fuel, which they are marketing as a "cold weather" motor gasoline, with quick starting properties. Should the demand for the California product develop further, it is expected that marketers will restore the quarter cent differential on this fuel which prevailed during the summer months.

East Coast refiners are reported to be adding to their gasoline storage somewhat, the heavy demand for bunker oil and furnace oil keeping production at a high level. This condition, it is reported, is true of the country as a whole, refinery runs not having shown the customary reductions for this season of the year. Part of the reason for this accumulation of gasoline stocks, it is felt, lies in the fact that most interests in the trade look for higher crude oil prices, and thus believe that their gasoline inventories will show appreciation. Refiners were compelled to draw heavily on their storage to take care of gasoline business during summer and fall months, and anticipate a repetition of this condition next year.

Tank Wagon Gasoline

The market is holding unchanged at 18 cents a gallon throughout the local territory. There has been a little talk in trade circles regarding the possibility of a 1-cent reduction in the tank wagon schedule by the end of the year, but thus far there have been no developments indicating that such a reduction was imminent. Refiners report that their gallonage is holding up exceptionally well for this season of the year, some marketers handling record volume for the early winter months.

With the market safely through the summer and fall seasons, interest is turning to the outlook for next year. There seems to be a general sentiment among trade interests that next year will witness some important changes in the marketing complexion in the East. These changes, it is expected, will result from negotiations now pending, and may force either a reallocation of the territory lines previously recognized, or a spreading out into adjacent territories on the part of most of the large marketers.

One rumored development, which is pretty well discounted by those in position to know, was that Standard Oil of New Jersey might sell its products in territory previously held principally by Standard Oil of New York. A development of this character is extremely remote, however, Standard Oil of New Jersey is marketing its U. S. Motor gasoline at its filling stations as "Standard" gasoline, and its premium motor fuel as "Esso." Standard of New York markets its regular motor fuel as "Socony" and its premium fuel as "Socony Special." Notwithstanding this, however, Standard of New York has retained "Standard" as the designation for its motor fuel, and at present has actions pending against distributors who have been marketing independent gasoline from pumps carrying the word "Standard" in large letters. It is not believed that the New York company would welcome the use of this word in its territory by any other company, even one with the close connections of the New Jersey organization.

Another bar to unrestricted competition in the tank wagon field will be the code of ethics to be considered by the industry at the Chicago meeting next month. While this code, of course, will not go into the question of territories, it will define just what practices in gasoline marketing are fair and which step over the boundary into the unfair classification. This code, presumably, will be subscribed to by the leading interests in the industry. Any attempt of one company to break into a territory dominated by another would naturally be an almost impossible undertaking unless the invading company was in position to offer many inducements which the holding company could not. The only inducements which accomplish the desired results these days are price cutting and under-cover concessions, and these will come under the ban of the industry's displeasure.

Kerosene

The market for kerosene underwent little modification this week. Refiners have a substantial volume of contract business on their books, and current production is moving readily into consuming channels. Steady buying of burning oil for export is tending to prevent the accumulation of much surplus kerosene at East Coast refineries. A little kerosene distillate has been received from California this month, and further shipments are reported to have been arranged. The market on water white continues held at 9 cents per gallon, bulk, tank car lots at Bayonne refineries, with jobbers in the market for large lots. Replacement buying on the part of many distributors is becoming more frequent, indicating a steady growth in consumption as the season progresses.

Tank wagon kerosene is strongly maintained on the basis of 15 cents per gallon for water white. This end of the business has shown steady expansion during the past six weeks, and refiners do not expect that peak for the season will be reached for some weeks yet. The increase in tank wagon business is more noticeable in districts outside of the metropolitan territory, the consumption of kerosene for use in small home heaters having fallen off in the city during the past few years. This decline, however, is more than made up by the heavier consumption of light oil in home furnace heating units.

Reports from other market centers indicate that kerosene is barely holding its own in many sections, and this, it is expected, will preclude much of an advance in the East Coast area, where the markets have been quite steady. Refiners are moving a satisfactory gallonage in kerosene now, and feel that any further price advances might create a differential which would make it profitable to ship in kerosene from other refining centers, thus disturbing the stability of the situation in this area. Were it not for this contingency, it is felt, a 9½-cent market on water white could reasonably be looked for by the end of the year.

Fuel Oil

Bunker "C" continues to command $1.05 per barrel at terminals, and the usual 5 cents per barrel additional for barging alongside within the harbor limits. There has been a strong demand for fuel oil from marine interests throughout the week, and contract withdrawals are well up to normal for this season of the year. While competition from Diesel oil is being increasingly felt at East Coast ports, the volume of business on this oil has not yet reached the point where it has made really serious inroads into that on Bunker "C" and no marked change is expected in the situation within the next few years, notwithstanding the increasing swing toward motor vessels. The present tonnage of fuel oil burning steamers, it is felt, assures the refiners an adequate outlet for their bunker oil.

An encouraging feature of the market here during recent weeks has been the uniformity of prices on fuel oil by leading refiners. Disturbances incidental to price shading have been missing now for some months past, and it is felt the market is now on a sounder basis than any other time thus far in the year. The trade is watching with interest developments in the situation, in an endeavor to get a line on the probable market trend for next year. With most of the large steamship business out of the way until 1931, only the small contracts remain to be closed for next year. The low prices quoted the shipping board on its requirements at Atlantic and Gulf ports are expected to have an important bearing on the price trend in bunker oil, but whether or not they will force a general downward revision to the level named in this contact remains to be seen. With indications of possible early developments in the agitation for a curtailment program in Venezuelan oil fields, and continued light output in Mexico, the outlook for the bunker fuel oil market for the coming year is brighter.

Sales of fuel oil for industrial purposes continued to run into large totals, the favorable position of this fuel, in comparison with coal, making for a marked preference for fuel oil on the part of many large industrial consumers.

Gas Oil

While the market has lost much of its firmness, there have been no general price recessions. The leading seller is still quoting 32-36 on the basis of 5¼ cents a gallon, bulk. Bayonne refineries, with other large refiners quoting 5 cents, and some stock available down to 4¾ cents, although the latter is more in the class of furnace distillate, and is sold generally as 28 plus. Refiners report that they are getting a good volume with the large gas companies, with other industrial consumers also drawing gas oil in heavy volume against contracts.

Most of the large-lot contract business for 1929 has already been lined up, and refiners' sales departments are now busy in gathering up the loose ends, and signing up some of the smaller consumers, who were passed up while the big users were being sold.

Diesel Oil

Steady markets for Diesel oil prevail, with the local quotation $2 per barrel, in bulk, f.o.b. refineries in the New York Harbor area. Considerable volume has been booked for 1929 with the large marine companies, but the price specified in these contracts has not yet been made public. It is believed, however, that concessions were given the large buyers, in view of the sharp reductions which bunker fuel oil buyers have been receiving from the refiners. Domestic industrial consumers have been slow to cover on next year's requirements thus far, but this end of the business does not attain the importance of the marine end.

The trend toward Diesel engines for powering large ocean-going yachts is engaging refiners' attention. Most of the large vessels of this character turned out recently, and a number now under construction, have Diesel plants, and they form no small factor in the market situation, although of course their consumption is very much less than that of the large transatlantic motor ships on regular runs.

Paraffin

Inquiry for spot wax has subsided a little this week, after the heavy volume of business placed during the preceding week, but prices have held their gains. The market appears to have been definitely taken out of the hands of operators who had been controlling the situation for some time past. A group of operators during the summer months sold the market short, and found themselves on the wrong side. They have been making first-of-the-month cash settlements on their contracts in many cases. Early in November, the market sagged and it appeared that the short sellers were to make good on their contracts, but an upward reaction developed almost immediately.

Refiners are now controlling the market situation to a considerable degree.

(Continued on Page 128)

PROPERTIES REQUIRED IN MOTOR FUELS

(Continued from Page 123)

is a convenient means of estimating the alcohol present.

The only fuels of use for the production of automotive power are (apart from certain exceptions) those without any great peculiarities. Exceptional fuels are only of value when sufficient supplies are available. An example of this is shown by benzol, which in Germany is so plentiful that it is used both alone and mixed with benzine; as a result German automobile engines tend to have comparatively high compression ratios. As, in the United States the total benzol production forms only a fraction of the motor fuel consumption, American car builders can only increase the compression ratio of their engines as better fuels become available.

Actually, Germany has a very large quantity of high-compression fuel for disposal. In 1927 the benzol production amounted to 300,000 tons, which with that imported, 114,000 tons, became 414,000 tons. Of this, only a small quantity was required for the chemical and rubber industries, etc., so that approximately 400,000 tons was available as fuel for motor engines. As the total German consumption for 1927 was 800,000 to 900,000 tons, this represents 50 per cent of the total consumption and corresponds, when mixed with the benzine, with a 40 to 50 per cent benzol mixture. Actually, in this particular year, a considerable portion remained unsold, for besides benzol, other high compression fuels such as "Motalin" (benzine "doped" with iron carbonyl) "Monoplin" (alcohol-benzine-benzol mixture) and lignite benzine were also available.

The net result is that the compression ratios of German automobile engines are higher than elsewhere. For export the compression ratios must be lowered. The average compression ratio of private cars run from 1:4.5 to 1:5, while for sports cars it is naturally very much higher. Certain lorries, e.g., the Krupp (1:6) and the Henschel (1:5 to 1:8) also have high compression ratios.

Unimportant Characteristics

The unimportant characteristics of fuels are referred to as follows:

Specific Gravity—From an early date the petroleum industry has measured the volatility of a fuel by means of its gravity, a low specific gravity being taken to indicate high volatility. This relationship only holds, however, when the benzines have been produced from similar crude oils and then only under special circumstances. In fact, owing to cracking and the many possible origins of the crude oil, no conclusions can safely be drawn from the specific gravity. Volatility can only be determined directly. Moreover, the specific gravity is an evaluation constant for with fuels of equal volatility, the higher the gravity, the better and in general, the mileage and the compression stability also.

Color

It is specified that volatile fuels must be colorless. While it is certainly true that color usually indicates poor refining and turbidity the presence of dirt or water, a faint yellow color, which is often found in practice, makes no difference whatsoever to the value of the fuel; colorless fuels are in fact often less valuable. No notice should therefore be taken of the color of a motor fuel. Many are actually being tinted intentionally, e.g., ethyl gas.

Stability to Light

All hydrocarbon fuels are affected by strong light with the result that they go "off color." Many benzines and benzols become turbid and eventually an insoluble layer separates. As, however, fuels are never subjected to such drastic treatment in practice but are always stored in impenetrable containers, this test is unnecessarily severe. No difficulty has been experienced in the use of iron carbonyl which is actually decomposed by light. Again the bearing of light-stability on storage-stability is not at all certain.

While the important characteristics of fuels are:

The three properties of a fuel which determine its value are: (a) volatility, (b) purity and (c) combustion characteristics.

Volatility—By volatility one must differentiate between the general position of the distillation curve, which is given by the average distillation temperature or index temperature, and the shape of the curve with respect to the slope of the average gradient; the distillation curve is usually intended. It is customary to give the initial boiling point, the distillate (per cent) at definite temperatures, for example, at 100, 120, 130 140, 150, 190 or at 200 degrees Centigrade, the 95 per cent distillate temperature and the final boiling point—further figures being given for higher boiling fuels. The distillation curve is not constant, however, and depends on the apparatus used. For benzine the Engler-Ubbelohde apparatus is used, while for benzols, Kramer and Spilker's apparatus is generally employed. As the final boiling point is not particularly accurate, the 95 per cent temperature is preferred. When distilling light fuels, e.g., natural gas gasoline, extra cooling is necessary for the condenser, to prevent losses.

According to the position of the distillation curve one can differentiate between various types of fuels.

(A) Up to an average distillation temperature of 125 degrees Centigrade: Motor spirit (gasoline).

(B) Up to an average distillation temperature of 135 degrees Centigrade: Heavy benzine (vaporizing oil).

(C) Up to an average distillation temperatures of 200 degrees Centigrade: Kerosene.

(D) Up to an average distillation temperature of 275 degrees Centigrade: Diesel oil.

Since the heat of vaporization of benzol is smaller than that of benzine hydrocarbons while that of alcohols is very much higher, it follows that the volatility of these fuels should be correspondingly less.

The slope of the distillation curves is in the following order: Alcohol and alcohol mixtures, benzol, benzol mixtures, benzine, heavy benzine, kerosene, gas oil.

The steeper the curve the greater is the tendency to give rise to incomplete combustion.

The absence of low boiling hydrocarbons is undesirable because difficulty is then experienced when starting, while heavy "tails" give rise to incomplete combustion and dilution of the lubricating oil (crankcase dilution). "Jumps" in the curve also tend to produce incomplete combustion.

Although the absence of volatile hydrocarbons gives difficult starting, too high a content (as in natural gas gasoline) gives trouble because it vaporizes in the warm fuel lines and produces "locks"; it also increases the danger of fire. No inference with respect to their behavior in the engine can be drawn by comparing hydrocarbon distillation curves with those obtained from alcohol-hydrocarbon blends.

Low boiling constituents are also desired in Diesel oils for, although the higher the boiling point the lower the spontaneous ignition temperature, low boiling constituents give more complete combustion.

Purity

Apart from freedom from inorganic matter, etc., low sulphur and gum content are also required. A small amount of sulphur in the oil, providing it is not present in a corrosive form, is not in any way injurious. A high sulphur content on the other hand may give trouble, the sulphurous acid, produced on combustion, corroding the exhaust valves. A much more serious danger is the accumulation of sulphurous or sulphuric acid in the water, usually found in the crankcase, producing corrosion.

Certain fuels containing dissolved gummy matter, or which form gum easily, tend to "gum-up" the inlet valves. This trouble in most cases is due to insufficient refining. Although the sulphuric acid test and the determination of the residue on evaporation both indicate the tendency to gum, in practice the engine test only is reliable.

Combustion Characteristics

When considering the combustion characteristics of a fuel, one must differentiate between the tendency to detonate and the tendency to form carbon.

The extent to which formation occurs is dependent upon the hydrogen-carbon ratio. For example, chemically pure benzol, H/C ratio equals 1, shows a greater tendency to form carbon than motor benzol (B.V. type) in which, owing to the presence of homologues, the H/C ratio equals ca. 1.5 while benzine, having a H/C ratio equals 2.1, only forms carbon with great difficulty. The same holds true for the higher boiling oils employed for Diesel engines.

Fuels containing oxygen, e.g., alcohol mixtures, burn exceptionally cleanly with absolutely no carbon formation. Addition of water to hydrocarbon fuels produces a similar effect.

In general, the tendency of a fuel to detonate is also determined by the H/C ratio, although with benzines the tendency to "knock" increases with the boiling point. The presence of certain groups, such as—OH groups and water itself, reduce detonation. Other substances which tend to suppress such as lead tetraethyl, iron carbonyl, etc. On the other hand, certain compounds, e.g., iso-propyl nittrite, induce detonation.

The converse is true for Diesel fuels, fuels poor in hydrogen, such as benzol and coal tar distillates, knocking slightly; this is probably on account of the delay in ignition and the resulting carbon formation. It can be prevented by introducing a small quantity of a fuel rich in hydrogen ("proknock" in constant-volume cycle engines) with the coal tar fuel.

Measuring Detonation

Several methods have been devised for measuring the detonating tendencies of various fuels, but so far no international standard has been adopted.

The compression stability of volatile fuels intended for constant-volume cycle engines is of considerable importance on account of the possibility of using high compression ratios which give higher power output and are more economical.

Conversely, it is possible that compression stability also has a bearing on the behavior of Diesel oils, as the spontaneous ignition temperature alone does not appear to explain everything.

The industry meets the requirements of the automobile engine users in the following manner:

German Fuel Requirements

The fuel requirements of German motor transport, etc.:

1. Benzine: (a) From foreign petroleum (principal part. (b) From home produced petroleum (insignificant.) (c) From chemical industry (synthesis.) (d) From lignite industry (lignite benzine.)
2. Benzol: (a) From home coal industry (principal part.) (b) From foreign coal industry (smaller part.)
3. Alcohols: (a) From potato fermentation (ethyl alcohol.) (b) From chemical and paper industry (from sulphite lye, wood, etc. (ethyl alcohol.) (c) From chemical industry (synthetic methanol.)

These are employed as follows:

A. Gasoline. (Average distillation temperature ca. 120 degrees Centigrade. Antidetonating value small: principal grades "Dapolin" and "Stellin.")

B. Benzol. (Average distillation temperature 100 degrees Centigrade. Antidetonating value very high, almost exclusively B.V. type.)

C. Motalin. (Benzine "doped" with iron carbonyl.)

D. Synthetic benzine. (Very similar to natural benzine; not yet characterized as synthetic.)

E. Lignite benzine. (Antidetonating value high.)

F. Monopolin. (Formerly a mixture of benzine, benzol and 95 per cent spirit, now an improved mixture of absolute alcohol and benzine.)

G. Racing monopolin. (Racing fuels oontaining methanol.) Monopolin R.

H. Benzine-benzol mixtures. (Mostly 50-50 mixtures of gasoline and benzol (B.V. type.) The most widespread mixture is "B.V. Aral.")

Although only very definite products are used for motor engines, oils varying from water white refined oils to heavy residues are employed for Diesel engines. These are chiefly provided by the petroleum industry but some lignite and coal tar distillates are also used.

A reduction in the number of fuels of different types is highly desirable, a smaller number of standard fuels being preferred. Motor benzol has already been standardized by the Benzol-Verband with great success. Standardization of motor fuels offers many advantages, not only to the engine designer and the consumer but also to the producer and the dealer.

German Requirements

The fuel position in Germany is at present changing chiefly because the German fuel requirements have increased enormously. In 1926 the consumption amounted to 600,000 tons while that for 1927 was between 820,000 and 900,000 tons. It is estimated that the fuel consumption for 1928 will be over 1,000,000 tons as both the number of vehicles in use and the size of the individual power units are increasing.

At present, Germany is in a position to produce practically half her total consumption at home. It is quite possible that by developing the synthetic benzine industry she will become entirely self-supporting. Whether plant will be erected with this end in view remains to be seen.

Under the circumstances, it is in the German interest to reduce the fuel consumption as much as possible and considerable attention is, therefore, being paid to increasing the compression stability of the fuels in order to raise the compression ratios of the engines.

Attempts are being made to solve the problem by engine design (Ricardo's combustion chamber, the Dumanois' stepped piston, and so on) as well as by increasing the compression stability of fuel through chemical means (iron carbonyl, lead tetraethyl, alcohol, developments in cracking process, etc.)

In summary, there are certain proposed specifications. Fuel requirements have become so definite that it is possible to select a small number of fuels as standards and specify their essential characteristics.

Suggested Fuels

The suggested fuels are:

A. Fuels of high velocity. (Gasoline.) (1) Low anitknock value. (2) Medium antiknock value. (3) High antiknock value.

B. Special fuels of medium volatility for aircraft.

C. Fuels of low volatility. (Diesel oils.) (1) Relatively low boiling range. (2) High boiling range.

The following properties to be standardized:

A. Volatility. (Average boiling point, fractionation index.)

B. Purity.

C. Compression stability. (The standard and measurement to be specified.)

D. Stability on storage.

E. Freedom from corrosive action.

F. Sulphur content.

G. H/C ratio.

H. Odor.

I. Stability to cold.

SOFTER UNDERTONE TO GASOLINE IN THE EAST

(Continued from Page 127)

Many were sold up on contract up to the end of October, but since these contracts have run out, they have not been booking futures to any considerable extent. Sellers in many instances are content to work on a month-to-month basis, evidently believing that the market, notwithstanding its very material advances in price this year, still has some distance to go before peak is reached.

There is a good movement of wax into export channels, export volume for the year thus far being materially ahead of last year's figures. The volume of export trading on this one item is significant of the position which American refin

products have attained in some foreign markets by virtue of the low prices at which they have been selling.

Most of the large refiners put out package wax for use in home preserving, and it is reported that sales of this article during the home canning season just ended were something in the nature of a record from the standpoint of volume. Several of the large refiners have obtained large distribution of this specialty through the various chains of 5 and 10-cent stores.

Petrolatum

Continued activity in this branch of the market was reported this week. Large consumers in the pharmaceutical trade were taking stocks in substantial volume against orders previously booked, and in addition there was considerable new business in this classification. The white grades were firmly maintained at the price advance put into effect during the previous week, with lily white holding at 7½ cents, snow white 8½ cents, and cream at 6½ cents per pound. The spurt in buying on the part of the domestic trade has been accomplished by a steady demand for white grades for export, and this division of the market was quite active this week. A good deal of the export petrolatum business, it is reported, is moving out through Philadelphia and Baltimore.

Sales of the lower grades of petrolatum have picked up along with the higher qualities. There is a good demand for dark green reported, and the market is generally held steady at 2 cents a pound, against sales recently put through at 10 points under this level. The amber grade holds steady at 3½ cents, with extra amber commanding 3¾ cents, and sellers talking advances on the latter two grades.

Refiners in the Pennsylvania and Ohio territories have taken firm price views on petrolatum, and are not inclined to book forward business in any large quantities at current-going prices. Petrolatum was one of the last of the refined products to show an upward move in line with the higher production costs resulting from the several advances in eastern crude oil prices this year, and refiners are showing a tendency to realize still better prices on their output. They are aided in this by the bullish condition of the market at present, owing to the seasonal expansion in demand, and the more favorable outlook for sales abroad. It is reported that stocks of petrolatum held by refiners in the East Coast territory are considerably smaller than was the case a year ago at this time, although definite data on the quantity held is lacking.

Lubs

Cylinder stocks came in for a broader movement this week, and the market strengthened further. Spot stocks of 600 steam refined were firm at 22½ cents, with 635 quoted at 23½ cents and 650 holding at 26 cents a gallon. Bright stocks were also in firmer position, with light 140-150 held at 42 cents a gallon and dark bringing 40½ cents a gallon. Other grades remained unchanged, but the price trend was upward. There was some variance shown in spot quotations, this being due to the fact that sellers in some instances had lubs on spot or cars rolling bought during the recent price dip, and thus had their purchases made at an average margin of 2 cents a gallon under the present refinery price basis.

Domestic demand had shown considerable improvement during the week, and although buyers consistently underbid the market when coming in for supplies, sellers reported that they were experiencing little difficulty in realizing full prices on sales. Many buyers had been deferring purchasing operation in the expectation of a general price break, and having thus permitted their spot stocks to run low, had some urgent requirements to take care of this week. A feature of the market was the improved volume of export sales. A number of inquiries which had reached the market during the preceding week were followed by actual purchasing this week.

Conditions showed no change in the market for red and pale oils. Refiners were firm at the price advances put into effect at the start of the month, and reported that the higher prices had not tended to curtail buying to any appreciable extent.

Industrial lubs were moving well. Spindle oil sales had shown some improvement, with further gains in this direction looked for. Refiners' sales departments are busily engaged this month in lining up contract business for 1929 among the industrial consumers of lubricating oils. A good volume of forward contract business has also been written during the past few weeks with some of the larger marine consumers.

Gasoline to France

Export trading in gasoline slackened off a little in this week's market. One cargo was reported sold at the Gulf, comprising 5,000 tons of 64-66 naphtha, 2,000 tons of Navy gasoline, and 1,000 tons of water white kerosene. There were no changes in export quotations during the week. Navy gasoline in cases held at 26.40 cents a gallon, with cased kerosene quoted at 17.65 cents for standard white and 18.90 cents for water white. A number of inquiries for mixed cargoes for shipment to the Continent were reported in the market toward the close of the week, but no additional sales were reported up to the time of writing.

More inquiry for export lubricating oils developed, and sales showed some improvement over the previous week. South America was a good buyer this week, and a substantial volume was booked for shipment to Great Britain and the Continent. A little lubricating oil business for shipment to Africa was noted during the period.

Paraffin sold in export channels in a larger way this week. The recent stiffening in the price basis has strengthened buyers' confidence in the market position, and some inquiries for fairly large blocks were reported in this market. A good volume for shipment out of the Gulf was reported done.

Low prices on gas and fuel oil have stimulated export inquiry for these products somewhat. A cargo of close to 2,500,000 bbls. of fuel oil cleared New York for Montreal early in the month, and it is expected that further quantities of fuel oil will be moved into the Canadian territory during the winter months, although the Canadian business is normally handled to a considerable extent by Imperial Oil from its own plants located in Canada.

California Oil Receipts

Receipts of California crude and refined oils at Atlantic and Gulf Coast ports for the week ended November 10 totaled 483,000 bbls., a daily average of 69,000 bbls., against 290,000 bbls., a daily average of 41,429 bbls. for the week ended November 3 and a daily average of 48,179 bbls. for the four weeks ended November 10.

(Barrels of 42 gallons)

At Atlantic Coast ports—	
Baltimore	80,000
Philadelphia	308,000
Others	95,000
Total	483,000
Daily average	69,000
Daily average four weeks ended	48,179

Distribution of total California oil receipts is as follows:

Gasoline	388,000
Kerosene distillate	95,000
Total	483,000

It is reported that considerable inquiry for California gasoline for shipment into East Coast territory has been apparent during the past few days, although in view of the soft market in the East, buyers are endeavoring to get California refiners to shade their quotations. At the present market for U. S. Motor gasoline in California, the fuel cannot be laid down in New York under 10 cents per gallon, it is declared. This price leaves distributors little margin to work on in an 11-cent market and with a possibility of a further cut in the tank car market in the East, it is obvious that buyers must secure further concessions from Pacific Coast sellers before much additional business can be actually placed.

Petroleum Exports

The following table shows principal exports of petroleum and refined petroleum products from New York during the past three weeks (all figures in gallons unless otherwise noted):

	Week ended—		
	Nov. 10	Nov. 3	Oct. 26
Gasoline	637,700	559,100	118,400
Naphtha	2,297,400	1,082,000	2,011,200
Kerosene	1,175,400	163,400	155,500
Fuel oil	2,335,500	53,600	.....
Lub. oil	1,375,000	1,464,000	3,169,000
Petroleum (refined)	262,400	2,993,000	2,622,200
	Pounds		
Petrolatum	.....	.....	.....
Paraffin wax	1,088,100	1,619,900	1,678,900
Refined	119,900	.....	222,500
Scale	346,300	350,800	410,700
Lub. grease	1,232,900	1,173,300	1,546,000

Imports

Imports of crude and refined oils at the principal United States ports for the week ended November 10 totaled 1,334,000 bbls., a daily average of 190,571 bbls., compared with 2,079,000 bbls., a daily average of 297,000 bbls. for the week ended November 3 and a daily average of 243,500 bbls. for the four weeks ended November 10.

(Barrels of 42 gallons)

At Atlantic Coast ports—	
Baltimore	192,000
Boston	130,000
New York	505,000
Philadelphia	128,000
Total	955,000
Daily average	136,428
At Gulf Coast ports—	
New Orleans and Baton Rouge	379,000
Total	379,000
Daily average	54,143
At all United States ports—	
Total	1,334,000
Daily average	190,571
Daily average four weeks ended	243,500

CHICAGO MOVEMENT MOSTLY ON CONTRACT

(Continued from Page 126)

the price situation here the change was not noticed.

Lubricating Oils

Lubricating oils are generally showing no change. Bright stocks continue strong, stocks being light and a good export demand aiding to maintain a strong position. Neutrals are being badly cut, particularly by the Gulf refiners. A satisfactory position is reported by the motor oil people and the industrial oils are very good in a general way although there is a great effort to get even the smallest business.

WIDE SPREAD IN GASOLINE PRICES

(Continued from Page 36)

months, a number of refiners are running considerable fuel oil to storage. Based on today's markets this fuel oil, if it is suitable for cracking, is worth approximately twice present quotations as raw material in the manufacture of gasoline. It is cheaper to store fuel oil than crude oil due to the difference in investment charge with the additional fact that the fuel oil can be stored in practically any type of steel storage without an evaporation loss. Refiners with available storage have established a minimum price which they will take for their fuel oil and are running to storage any surplus.

Will Affect Gasoline

It has been pointed out that this tendency to store fuel oil will have an important bearing on the gasoline and crude oil market for the next few months. Refiners who are running fuel oil to storage will obviously not be in a position to store large quantities of gasoline during the winter months. This will mean that they will offer the bulk of their gasoline from week and week and with slow up in domestic demand and no decrease in production this may become an important factor in the gasoline market.

Later the refiners expect to crack this stored fuel oil unless there is a marked improvement in the spot market, a development which is not considered probable in the near future. A greater use of cracking next year will mean either a similar increase in gasoline output or, in case the gasoline production is not increased, less crude oil will be needed. Market students who are attempting to gauge markets for next year are taking these factors into consideration and are closely watching developments.

Gasolines and Naphthas

Weighted average prices on four grades of gasoline on Monday based on reports from representative refiners showed very little change over the previous week. Monday sales were light, but there was apparently no disposition on the part of the refiners to reduce their quotations to jobbers.

Grade—	Price Nov. 19	Price Nov. 12
58-60 437 endpoint	.0932	.0933
60-62 437 endpoint	(*)	.0950
60-62 400 endpoint	.0975	(*)
64-66 375 endpoint	.10375	.1075

*No sales reported.

The prices reported on the higher gravity grades were for domestic shipment. The arrival of colder weather had aided the domestic demand coming from the northern states.

Strictly 50-52 450 endpoint naphtha is hard to find in the Oklahoma market and prices are firm. Frequently refiners have material lower in gravity with high initial and endpoint and these grades can be bought from one-quarter to one-half cent under the regular naphtha grade.

Kerosene

Kerosene prices were firm in Oklahoma during the week, although some observers feel prices are due for a decline. The domestic demand is steady and occasional export purchases of low priced material from Mid-Continent refiners is responsible for the firm market.

Lubricating Oils-Wax

Bright stocks are as strong as neutrals are weak in the Oklahoma market. The Oklahoma market in bright stocks has responded to the generally strong market reported from all parts of the country and refiners in most instances are sold up and behind in their deliveries.

Neutrals in contrast are moving slowly and price concessions are being given to large buyers. This dullness is believed to be seasonal, some of the buyers preferring the low cold test neutral available in the Gulf Coast. Wax prices are unchanged.

NEW JERSEY EMPLOYES STOCK PURCHASE PLAN

NEW YORK, Nov. 17.—The Standard Oil Co. of New Jersey has announced the terms of the third stock acquisition plan for employes, which becomes effective January 1 and runs for three years, the second plan expiring December 31, this year.

Under the terms of the third plan, no employe who has participated in the second plan and disposed of more than one-third of his stock is eligible to share in the third plan, nor can any employe who participated in both the first and second plans and has disposed of more than one-half the stock so acquired.

Each employe participating in the third plan will authorize the company or the subsidiary for which he works to deduct from money due him a sum not in excess of 10 per cent thereof, this to be placed in the purchase-plan fund to his credit. The employing company will add 50 per cent of this amount to his deposit.

BIG AMALGAMATION IN OIL TOOL INDUSTRY

(Continued from Page 122)

son-Ballagh the same privilege of distributing the tool joints and collars. Incidentally, the name U. S. antifriction tool joints and collars has been changed to "B. J. antifriction tool joints and collars," the ball bearing race being eliminated and Bettis protectors substituted therefor.

Pump Division

Pipe line pumps; hot oil pumps; deep well turbine pumps; special pumps for industrial and domestic service.

"Further announcements regarding the expansion of the Byron Jackson organizations are to be made in the near future," concludes Mr. Schurman.

Brief Items for Petroleum Refiners

HIGHER GASOLINE TAX PREDICTED NEXT YEAR

CHICAGO, Nov. 17.—Present gasoline tax rates in many states will be raised within a year to provide additional funds for highway construction, according to predictions made at a meeting of the American Association of State Highway officials held here this week. It was pointed out that the public wants the road construction programs to continue, and it is argued higher gasoline taxes are the logical method of raising the necessary funds in most states.

The approval given the Missouri $75,000,000 bond issue and the $100,000,000 fund in Iowa were pointed to as indicating the trend in highway improvement. It was also stated that the federal Government will increase its appropriations for road building.

To provide adequate roadways in the metropolitan districts has proven a problem that has taxed engineering skill with no really adequate solution. Roads have been widened, one-way traffic roads and elevations over intersections have been adopted, but the jam at the entrance to the great cities seriously interferes with the pleasure of driving.

It was suggested that some plan be found to make the heavy traffic vehicles engaged in the public transportation of freight and passengers pay an adequate return for the use of the public highways. This traffic is cutting into the revenue of the railways largely through the providing of transportation at low rates, possible only because of the free use of the public highways.

MID-CONTINENT BUILDS TWO MAMMOTH STILLS

The Mid-Continent Petroleum Corp. at its West Tulsa refinery has started work on the construction of two of the largest and most complete pipe still units ever installed at a refinery located in the Southwest. Each of the units will have a crude oil capacity of 10,000 bbls. daily.

The new units are said to incorporate new developments in design which will not only give the maximum efficiency in pipe still operation but will also enable the owners to secure products not previously obtained from Mid-Continent crude oils. In addition to gasoline and kerosene which will be obtained as finished products, wax distillate, gas oil, long residuum and cylinder stocks will be taken overhead from the towers.

The design of the units is the result of two years of investigation on the part of the development department of the Mid-Continent corporation co-operating with the Foster Wheeler Corp., which has charge of the installation. The Mid-Continent refinery is the largest in the Mid-Continent Field and in the past has used shell stills exclusively in refining crude oil.

It is expected that the new pipe stills will be ready to operate by July 1.

ENLARGE REGAL REFINING

Regal Oil & Refining Co. is extending its plant in the Manchester subdivision of Calgary, Alberta, Canada, to provide an aggregate daily capacity of 1,000 bbls., and is planning to extend its string of service stations outside Calgary. Spooner Oils, Ltd., has increased its interest in the refining company from 30 to 43 per cent of the issued stock.

LOUIS GRASSE DIES

CHICAGO, Nov. 17—Louis Grasse, a leading oil man who founded the Grasse Brothers Oil Co., at Sheboygan, Wis., in 1918, died November 15. Mr. Grasse has been in failing health for some months.

EXPECT OTHERS TO ADOPT MARKET PLAN OF STANDARD OF NEW JERSEY

NEW YORK, Nov. 17.—Definite indication that the refining and marketing interests in East Coast territory have decided upon a thorough housecleaning in their marketing activities was furnished here this week when the Standard Oil Co. of New Jersey announced a new marketing policy, intended to eliminate unbusinesslike practices from the industry.

Announcement was made by the New Jersey company that effective November 21, in Maryland, New Jersey, Virginia, West Virginia, North and South Carolina, and District of Columbia, all concessions to the commercial trade will be withdrawn.

All discounts from the posted tank wagon gasoline schedule will be discontinued and a so-called "true" tank wagon price of 15 cents a gallon put into effect on that date. This is 2 cents under the present tank wagon schedule, which averages 17 cents a gallon in the territories mentioned. The service station price on Jersey's gasoline will be 3 cents a gallon over the tank wagon basis, and gasoline will be sold at only one price from the company-owned service stations. Of course, while the differential will be the same, the price charged at retail will vary in different states, due to differences in the rate of taxation on gasoline sales in these states.

While the announcement of Standard Oil Co. of New Jersey of course dealt only with its own policy, it is thought that the revision in selling method made by this company presages a general change in the territory. Leading executives in the East Coast area for the past few months have had under advisement a proposed code of ethics defining fair and unfair trade practices in gasoline and other marketing activities. A committee to consider a suggested code of ethics, under the chairmanship of R. C. Holmes, president of The Texas Corporation, and comprising leading oil company executives, met recently under the auspices of the American Petroleum Institute and drafted a suggested code of ethics. This meeting, regional in character, was one of a series held in various parts of the country. The result of these group meetings will be reported at the annual meeting of the American Petroleum Institute in Chicago next month, at which time it is expected that a code of ethics to apply to the entire American refining and marketing industry will be drafted and adopted.

New Basis

Standard Oil Co. of New Jersey, individually, has been a leader in the move to get gasoline marketing conditions back on a stable basis in this area. It has been greatly strengthened in its campaign by the influence which its large number of company-owned filling stations has been able to exert. In some sections, the company had succeeded in establishing a 2-cent margin in the open market, but it evidently saw the need for a thorough-going revision and the wiping out of any old agreements and sales policies which may have been carried over and which were antagonistic to economic marketing methods.

The restoration of business-like marketing practices in the East Coast territory was undertaken in aggressive fashion during the first quarter of the current year. For the past three or four years, gasoline marketing activities in the East have been little short of chaotic in many cases. Secret rebates, more or less open price cutting, subsidizing of filling station owners, advertising allowances, pump rentals, and other uneconomic practices became common. It was a race for gallonage and as is so often the case in unrestrained competition of this character, the situation soon got beyond the control of even the leading factors in the industry.

So sharp was the quest for volume that profit was often sacrificed that gallonage totals might continue to mount. Refiners, at the outset, undertook their "competitive marketing" programs with the idea of extending their retail outlets, and providing distribution for the considerable overproduction which all were indulging in. Marketers with established

(Continued on Page 141)

TEXAS-EMPIRE LINE CO. INCORPORATED

CHICAGO, Nov. 20.—The Texas-Empire Pipe Line Co. which will build a pipe line connecting the Mid-Continent Field to refineries located in the Chicago area has been incorporated in Illinois with a capital stock of $1,000,000. The incorporation papers state it is the purpose of the company to own and operate pipe lines, oil tanks and water and gas lines. The address is given as 38 South Dearborn Street.

The Texas Corporation and the Empire Oil & Gas Co. will own the capital. A 12-inch pipe line is to be built connecting to The Texas Company refinery at Lockport, Ill., and a refinery which the Empire Oil & Refining Co. will build in or near Chicago. Representatives of the Empire company have been in this section during the past week negotiating for a refinery site.

ILLINOIS TAX SUIT TO SUPREME COURT

CHICAGO, Nov. 20.—Circuit Judge C. C. Briggle at Springfield has decided against several oil marketing companies which early in the year brought suit for the recovery of gasoline taxes paid the State when the Illinois 2-cent gasoline tax was effective. The law providing for the tax was declared unconstitutional after it had been enforced for several months. The oil companies then brought the suit for the return of the tax paid the states.

It is expected the case will be appealed to the Supreme Court of the State. In the meantime the funds are tied up by an injunction from the Federal courts. Unless some settlement is made by agreement final decision may not be reached for three years.

CHICAGO GASOLINE RECEIPTS

CHICAGO, Nov. 17.—The city oil inspector reports that 474,308 barre's of gasoline of 50 gallons each were inspected during October. This is an increase of 7,073 barrels over the same month in 1927 and a decrease of 51,448 barrels from the receipts of September, 1928. The October receipts are the smallest of any month this year since April when the total number of barrels received was 436,897.

NEW COMPOUNDING PLANT

CHICAGO, Nov. 17—G. E. Steigerwald has retired from the Wall-Steigerwald Co., and has organized the Steigerwald Petroleum Co. with offices and plant at 9006 Bessemer Ave., Cleveland, Ohio. The new company will compound oils and greases of all kinds including jobbers' specification oils and compounds and will do a marketing business in petroleum products.

TO BE SUPERINTENDENT OF BIG SPRING PLANT

FORT WORTH, Tex., Nov. 19.—C. B. Faught, well known in refining circles on the Gulf Coast and in North Texas, has accepted a position as superintendent of the Richardson Refining Co.'s Big

C. B. Faught

Spring, Tex., plant. The plant is a 5,000-bbl. capacity plant now under construction and will operate on Roberts Pool crude from southern Howard County. Mr. Faught recently was superintendent of the Texas Pacific Coal & Oil Co. refinery at Fort Worth.

CITY SERVICE ENTERS MARKETING IN TOLEDO

The City Service Oil Co. of Ohio, a subsidiary of the City Service Co., has acquired the marketing properties of the Cameron Oil Co., Toledo, and the John Stevens Oil Co. at Genet, Ohio.

The purchase of the Cameron properties marks the entry of the City Service Oil Co. in the retail marketing field of Ohio. The company will build new stations in Toledo and enlarge its marketing facilities generally in Ohio.

Within a year it is expected that the stations of the Ohio subsidiary will be supplied with gasoline and other products from the refinery which will be built by the Empire Oil & Refining Co. near Chicago. The Empire company also is a subsidiary of the City Service Co. The City Service Oil Co. is one of the major distributors in the State of Ohio.

ELECT REDFIELD PRESIDENT

H. H. Redfield, of Smethport, Pa., has been elected president of the McKean County Refining Co., operating a refinery at Farmers Valley, Pa. The election of Mr. Redfield is a part of a reorganization of the company which will be completed at the annual meeting of the stockholders in January.

Mr. Redfield has been a prominent producer in the Bradford area of Pennsylvania for several years. He will take active charge of the McKean company's operations. The Farmers Valley refinery is a lubricating oil plant having a capacity of 1,000 bbls. daily. Practically all of the stock in the company is owned by producers in the Bradford Field. Mr. Redfield succeeds F. F. Moore, formerly president and general manager of the company.

Natural Gasoline Manufacture

Trend Toward More Price Uniformity In Gasoline Grades

Natural gasoline prices are gradually showing a smaller diferential among the various grades and if the present trend continues the C grade will be sold at a higher relative price over the coming winter season than in any recent years. Manufacturers have installed equipment which gives their plants greater recoveries on their stabilized grades and many factors from the standpoint of marketing have led to more and more of the higher grades being made leaving a relatively few companies to manufacture the C grade.

The whole program is automatically bringing about a standardization and some manufacturers have gone so far as to predict the ultimate elimination of some of the more volatile grades, from the regular list.

From the standpoint of marketing, the increasing use of natural gasoline abroad and the corresponding increase in the shipments of natural gasoline from the Mid-Continent to the Gulf Coast refineries for blending has probably been the greatest factor in causing this trend. Only the more stabilized grades may be used here of course because of the excessive losses that would occur in handling and storing. Some of the export gasoline stands in storage for many months after it reaches the bulk station and foreign buyers have demanded the stabilized grades exclusively.

Likewise, refiners have also specified the A and AA grades in their purchases in practically all cases and are particularly careful to buy these during the warmer months and whenever any natural is run to storage. With these two factors influencing the choice of the A and AA grades on the part of refiners there is no great amount of the more volatile grades left to be purchased. Also, if a refiner does choose to buy the lower recovery grades because of their price advantage, he is running chances of excessive loss claims from his customers and leads to dissatisfaction on the part of the customer.

Manufacturing Viewpoint

On the other hand, the trend toward increased stabilization on the part of the industry in general should not be taken as a signal for a few to break away and increase their production just because it now appears the C grade will enjoy a relatively higher market over the coming winter season.

Practically all manufacturers have enough flexibility in their equipment and operations that a large share of their production could be converted into the C grade. With the market taking a very limited amount and much of that controlled by a few companies, the C market could be easily broken during the colder months we are now entering.

VISIT PHILFUELS PLANT

The Philfuels Co., a subsidiary of the Phillips Petroleum Co., has invited the Flammable Liquids Committee of the National Fire Protection Association to visit their Burbank, Okla., natural gasoline plant during the last day of the committee's 3-day meeting November 20. 21 and 22. The association acts as an advisory body for the fire underwriters in fixing equitable insurance rates and is national in scope.

The committee is composed of approximately 27 members and the members represent all industries manufacturing and handling flammable fuels. The bottled gas department of the Phillips Petroleum Co.'s Burbank plant will be of special interest to the committee.

NEW POOLS IN GREATER SEMINOLE TO INCREASE GASOLINE PRODUCTION

The increased drilling activity in the Greater Seminole area will be reflected in the natural gasoline production of that section according to information obtained from manufacturers during the past week.

Special interest is apparent in the possibility of the Mission Pool where approximately 90 wells are drilling. This pool which adjoins the Bowlegs Pool on the west was discovered several months ago. By agreement among the producers general drilling was not permitted until November 15. It is expected that between 125 and 150 wells will be drilling in that area within a short period. The wells are to be allowed to flow on February 15 at which time a decision will be reached as to whether any restrictions are to be placed on the operations of the completed wells.

Until these wells are completed any estimates as to the quantity of gas available for gasoline extraction are guesses. Some estimates as high as 100,000 bbls. daily are placed on the flush crude oil production of the pool and if this prediction materializes it is probable that a production of a 100,000 gallons of natural gasoline will be obtained.

The Gypsy Oil Co., which drilled the discovery well, owns the greater part of the proven and semiproven acreage in the pool and is now drilling 35 wells. The company will start work immediately on the construction of a natural gasoline plant in SW NE, Section 7-8-6. The plant will have an initial capacity of 30,000 gallons with provision made for enlargement. Should the Gypsy acreage show as large crude oil production as is anticipated it is certain that the plant's final output will be at least double the initial capacity. The company at present is one of the larger manufacturers in the Greater Seminole area having plants loacted in the South Little River areas.

In addition to the Gypsy company the Independent Oil & Gas Co., Roxana Petroleum Corp., and the Carter Oil Co., all of which are natural gasoline manufacturers in the Greater Seminole area have drilling wells in the Mission Pool. The Independent company has already started construction on an 8-unit combination gas lift and gasoline plant on its Payne lease in Section 7-8-6 in the Mission Pool. This plant should have a minimum output of 10,000 gallons daily. The Carter company does not expect to build a plant on its acreage.

The wells in the Mission Pool are producing from the Wilcox sand and manufacturers expect that the volume of gas available and its gasoline content will be the same per well as that obtained from Wilcox sand wells in other Seminole pools. The bulk of the present natural gasoline output in Seminole comes from the Wilcox sand wells.

Maud Pool

In the Maud Pool which is about 4 miles west of the Mission Pool, the Amerada Petroleum Corp. had completed arrangements for the construction of an oil absorption plant which will have a capacity of 50,000 gallons daily. The plant is located on its lease in Section 7-8-5. In addition to its own leases, the corporation has contracted for the gas supplies of other companies operating in that area. This new plant will not be in operation until after the first of the year.

In the North Maud area of Section 7-8-5 the Shell Petroleum Corp. (Roxana) has under consideration the construction of a plant. In Section 29-7-5, east of the St. Louis Pool, the same corporation has started operating the first units of a new plant which is expected to have an output of approximately 50,000 gallons daily in the near future. This plant is of the oil absorption type and in addition will provide 8,000,000 cubic feet of gas daily for the gas lift. Approximately 25,000,000 feet of gas will be available to the plant from leases in that section.

Just what effect these new plants will have on the total production of the Greater Seminole cannot be determined. The bulk of the new output will not be available until after the first of the year and in the case of the Mission Pool it probably will be March 1 before the natural gasoline is offered on the market in large quantities.

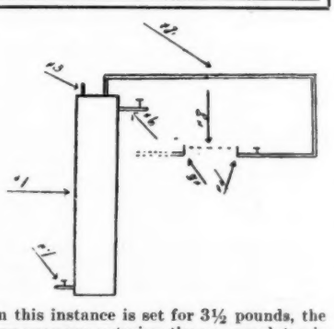
Some observers predict by March there will be a substantial drop in the natural gasoline output of the older pools. The present production is in excess of 1,000,000 gallons daily, the new plants in the Little River area having added materially to the production. The Little River output is nearing a peak, leading to the conclusion by some observers that the total output will show a gradual decline after the first of the year until it is determined what production will be available from the Mission Pool and other producing areas.

A Practical Suggestion

AUTOMATIC AIR REGULATOR

A simple and practical apparatus giving good results by holding an even pressure in connection with the inflow gas through the gas regulator into the absorbing tower may be made inexpensively in the following manner:

An air tank made of a piece of 6-inch pipe 3 feet in length is equipped with a low-pressure relief valve after closing both ends of the pipe. The bottom of the air tank has a bleeder for removing any foreign matter which may accumulate and near the top of the air tank is another connection with a valve for equalizing the pressure if necessary. The low-pressure relief valve is placed in the top of the air tank and set for the desired pressure. In the top of the air-tank pressure regulator also is connected a one-quarter-inch length of pipe which leads to the air valve on the gas regulator which controls the gas pressure entering the absorbing tower. The relief valve on the air-tank pressure regulator



in this instance is set for 3½ pounds, the gas pressure entering the gas regulator is 11 pounds, the gas pressure is reduced upon leaving the gas regulator to 3½ pounds.

Practical suggestions by those connected with the construction and operation of natural gasoline plants are invited. Payment will be made as soon as suggestions are accepted. Address all communications to the Natural Gasoline Department, The Oil and Gas Journal, Tulsa.

GILLMORE COMPLETING PLANT AT PAMPA, TEX.

The Forrest E. Gillmore Co. is completing the construction of an oil absorption plant on the lease of the Guernsey Oil & Gas Co., 4 miles west of Pampa, Tex., in the Panhandle area. The exact location of the plant is given as Lot 163, Block 3, of the I.&G.N.R.R. Survey. The plant will be in operation early in December.

The plant will operate with a well pressure of 30 pounds. Approximately 30,000,000 feet of gas is available. The flush gas is lean having a content of about three-fourths gallon per 1,000 cubic feet. The history of wells in that area shows that as the gas declines in volume, the gasoline content becomes greater. When well pressure is no longer available the Gillmore company will install compressors for plant operation.

The company has made a contract with the Western Carbon Co. covering the output of residue gas. The Western company is building a carbon black plant 3 miles north of the Gillmore gasoline plant to take care of the residue gas. The Pampa is the fourteenth to be built by the Gillmore company.

The company is installing two 400 horsepower compressors at its Allen, Okla. plant. The compressors will be used to boost 4,000,000 cubic feet of residue gas daily to the line of the Allen Pipe Line Co.

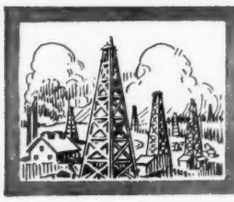
MAY PRODUCE GASOLINE IN MUSKEGON OIL FIELD

MUSKEGON, Mich., Nov. 12.—Large gas supplies are being found in the Muskegon fields and recent tests have shown a sufficient quantity of natural gasoline vapors to lead to an investigation on the part of one large manufacturer in the Mid-Continent Field with the possibility a gasoline plant will be built in the field to handle up to 30,000,000 feet of gas per day.

Samples of the gas from the Traverse and the Dundee formations have been taken to the laboratories for testing and the gasoline content has averaged about 1 gallon per 1,000 feet on the samples tested thus far.

The greater share of the gas is coming from the Dundee sand and the supply continues to hold up well so far as tests have been able to show thus far. At present there are about 3,000,000 feet of gas being exhausted into the air in the entire field, the average well producing about 1,000,000 feet daily. As the field is further developed new supplies will probably justify the erection of a plant, particularly because of the favorable location of the field with respect to distribution.

At present there are no natural gasoline plants in Michigan and the supply comes from the Mid-Continent for the most part. Ohio and Kentucky plants supply a portion of the material but production in these states is also limited and any new supply could no doubt find a ready market in that area.



REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

GASOLINE AND NAPHTHA

	Nov. 20		Nov. 13		Nov. 6	
OKLAHOMA (Group 3)—						
50-52 450 endpoint	.08½	.08⅝	.08½	.08¾	.08¾	
56-58 450 endpoint	.08½	.08⅝	.08½	.08¾	.08¾	.09
58-60 450 endpoint	.08⅝	.08¾	.08¾		.08¾	.09
*58-60 437 endpoint (U. S. Motor)	.0932		.0933		.09568	
*60-62 437 endpoint	†.09	.09½	.0950		.09900	
*60-62 400 endpoint	.0975		†.09½	.09¾	.10250	
*64-66 375 endpoint	.10375		.1075		.11000	
68-70 360 endpoint	.10¼	.10½	.10¼	.10½	.10¼	.10½
64-66 437 endpoint (blend)	.09	.09¼	.09¼	.09½	.09¼	.09½
NORTH TEXAS—						
56-58 450 endpoint	.08⅜	.08½	.08½		.08¾	
58-60 450 endpoint	.08½		.08½		.08¾	
58-60 437 endpoint (U. S. Motor)	.08⅝	.08¾	.08¾		.09	.09¼
60-62 400 endpoint	.09¼	.09½	.09¼	.09½	.09¼	.09½
64-66 390 endpoint	.09½	.09¾	.09½	.09¾	.09¾	
64-66 375 endpoint	.09⅞	.10	.09⅞		.09⅞	
68-70 360 endpoint	.10	.10¼	.10	.10¼	.10	
64-66 437 endpoint (blend)	.09	.09⅛	.09	.09¼	.09¼	
NORTH LOUISIANA—						
58-60 437 endpoint (U. S. Motor)	.09¼	.09⅜	.09½		.09½	
ARKANSAS—						
58-60 437 endpoint (U. S. Motor)	.09¼		.09½		.09½	
PENNSYLVANIA—						
52-54 Naphtha	.09¾	.10	.10¼	.10½	.10¼	.10½
54-56 Naphtha	.10	.10¼	.10½	.10¾	.10½	.10¾
58-60 Gasoline	.11	.11⅛	.11	.11⅛	.11	.11¼
60 Gasoline	.11½	.11¾	.11½	.11¾	.11½	.11¾
62 Gasoline	.12¼	.12¾	.12½	.12¾	.12½	.12¾
64 Gasoline	.12¾	.13	.12¾	.13	.12¾	.13
CALIFORNIA—						
58-60 437 endpoint (U. S. Motor) domestic	.10	.11	.10	.11	.10	.11
CHICAGO DISTRICT (Based on Group 3)—						
50-52 450 endpoint (Naphtha)	.08½	.08¾	.08¾		.08¾	
56-58 450 endpoint	.08½	.08¾	.08¾	.09	.09	
58-60 437 endpoint (U. S. Motor)	.08¾	.09¼	.09	.09¼	.09¼	.09½
60-62 400 endpoint	.09½	.09¾	.09½	.09¾	.09¾	.10
64-66 375 endpoint	.10¼	.10½	.10¼	.10½	.10¼	.10½
68-70 360 endpoint	.10¾		.10¾	.11	.10¾	
64-66 437 endpoint (blend)	.09¼	.09½	.09¼	.09½	.09½	

*Weighted average prices November 19 as reported by representative refiners. Sales to jobbers only. †No sales reported. Price general market.

NATURAL GASOLINE

	Nov. 20		Nov. 13		Nov. 6	
OKLAHOMA (Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.08¾		.09⅜		.09⅝	.09¾
Grade AA, 80-87.9, 375 e.p., rec. 90%	.08¾		.09¼	.09⅜	.09⅝	
Grade B, 76-83.9, 375 e.p., rec. 85%	.08⅜	.08½	.09⅛		.09½	.09⅝
Grade BB, 84-92, 375 e.p., rec. 85%	.08⅜	.08½	.09⅛		.09½	
Grade C, 80-90, 375 e.p., rec. 78%	.08¼	.08⅜	.09⅛		.09½	
NORTH TEXAS—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.08¾	.08⅞	.09¼		.09⅝	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.08¾		.09¼		.09⅝	
Grade B, 76-83.9, 375 e.p., rec. 85%	.08¾	.08½	.09	.09⅛	.09½	
Grade BB, 84-92, 375 e.p., rec. 85%	.08¾		.09		.09⅞	.09½
Grade C, 80-90, 375 e.p., rec. 78%	.08¼		.09	.09⅛	.09¼	
NORTH LOUISIANA—						
Grade AA, 80-87, 375 e.p., rec. 90%	.09	.09¼	.09½		.09¾	
Grade BB, 84-92, 375 e.p., rec. 85%	.08¾	.08⅞	.09¾	.09½	.09⅝	.09¾
Grade C, 80-92, 375 e.p., rec. 78%	.08⅜	.08¾	.09¼		.09⅝	
CALIFORNIA—						
75-78, 375-390 endpoint	.07	.07½	.07	.07½	.07	.07½
CHICAGO DISTRICT (Based on Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.08¾		.09¾		.09⅝	.09¾
Grade AA, 80-87.9, 375 e.p., rec. 90%	.08¾		.09¼	.09⅜	.09⅝	
Grade B, 76-83.9, 375 e.p., rec. 85%	.08⅜	.08½	.09¼		.09½	
Grade BB, 84-92, 375 e.p., rec. 85%	.08⅜	.08½	.09⅛		.09½	
Grade C, 80-90, 375 e.p., rec. 78%	.08¼		.09	.09⅛	.09¼	

BURNING OIL

	Nov. 20		Nov. 13		Nov. 6	
OKLAHOMA (Group 3)—						
41-43 water white Kerosene	.05¾	.06	.05¾	.06	.05¾	.06
42-44 water white Kerosene	.06	.06¼	.06	.06¼	.06	.06¼
NORTH LOUISIANA—						
41-43 prime white Kerosene	.06⅜	.06½	.06¾		.06¾	
NORTH TEXAS—						
41-43 water white Kerosene	.05⅝	.05¾	.05⅝	.05¾	.05⅝	.05¾
40-42 water white Kerosene	.05½		.05½		.05½	
ARKANSAS—						
41-43 water white Kerosene	.06¼	.06½	.06⅛	.06¼	.06⅛	.06¼
PENNSYLVANIA—						
43 Kerosene prime white	.07¼	.07⅜	.07¼	.07⅜	.07¼	.07½
45 Kerosene water white	.07¼	.07⅜	.07¼	.07⅜	.07⅛	.07⅜
46 Kerosene water white	.07⅜	.07⅞	.07⅝	.07⅞	.07⅝	.07⅞
47 Kerosene water white	.08	.08¼	.08	.08¼	.08	.08¼
300 Mineral Seal	.07¼	.07½	.07¼	.07½	.07¼	.07½
CALIFORNIA—						
38-40 water white Kero. (high-burning test)	.06¾	.07¼	.06¾	.07¼	.06¾	.07¼
Engine distillate, 43-44, 445 endpoint	.07½	.08	.07½	.08	.07½	.08
Engine distillate, 42-44, 480 endpoint	.07	.07½	.07	.07½	.07	.07½
CHICAGO DISTRICT (Based on Group 3)—						
41-43 water white Kerosene	.05¾	.06	.05¾	.06	.05¾	.06
42-44 water white Kerosene	.06¼	.06½	.06¼	.06½	.06¼	.06½

FUEL OILS

	Nov. 20		Nov. 13		Nov. 6	
OKLAHOMA (Group 3)—						
Below 18 Fuel Oil, per bbl.	.50	.55	.52½	.55	.52½	.55
18-22 Fuel Oil, per bbl.	.55	.57½	.55	.60	.55	.60
22-26 Fuel Oil, per bbl.	.57½	.60	.57½	.60	.57½	.60
24-26 Fuel Oil, per bbl.	.60	.65	.60	.65	.60	.65
26-30 Fuel Oil, per bbl.	.65	.70	.65	.70	.65	.70
28-30 Fuel Oil, per bbl. (industrial)	.77½	.82½	.77½	.82½	.77½	.82½
28-30 Fuel Oil, per bbl. (zero cold test)	.85	.87½				
32-36 Gas Oil (dark)	.02¾	.02½	.02⅞	.02½	.02¾	.02½
32-36 Gas Oil (straw distillate)	.02½	.02⅝	.02½	.02⅝	.02½	.02⅝
36-38 Distillate	.03	.03¼	.03	.03¼	.03	.03¼
38-40 Straw Distillate	.03¼	.03½	.03¼	.03½	.03¼	.03½
NORTH TEXAS—						
Below 20 Fuel Oil	.50	.52½				
24-26 Fuel Oil, per bbl.	.52½	.55	.52½	.55	.52½	.55
32-36 Gas Oil (straw)	.02¼	.02⅜	.02¼	.02⅜	.02¼	.02⅜
38-40 Straw Distillate	.02⅞	.03	.02⅞	.03	.02⅞	.03
NORTH LOUISIANA—						
18-20 Fuel Oil, per bbl.	.70	.75	.70	.80	.70	.80
32-36 Gas Oil	.03	.03¼	.03	.03¼	.03	.03¼
ARKANSAS—						
33-36 Distillate	.03¼	.03½	.03¼	.03½	.03¼	.03½
32-36 Gas Oil (straw)	.03		.03		.03	
16-22 Refinery Fuel Oil, per bbl.	.75		.75	.80	.75	.80
GULF COAST (South Texas)—						
Gas Oil	.04	.04½	.04	.04½	.04	.04½
Bunker C Fuel, per bbl.	.80	.90	.80	.90	.80	.90
PENNSYLVANIA—						
30-34 Fuel Oil	.04¼	.04½	.04⅛	.04¼	.04¼	.04½
36-40 Fuel Oil	.04⅝	.04¾	.04⅝	.04¾	.04½	.04⅝
CALIFORNIA—						
33-36 Distillate	.03¾	.04	.03¾	.04	.03¾	.04
27-32 Distillate	.03		.03	.03½	.03	.03½
*15-20 Fuel Oil, Bunker (at tide water)	.85	1.00	.85	1.00	.85	1.00
15-20 Fuel Oil (cargo lots), per bbl.	.75	.85	.75	.85	.75	.85
27 plus Diesel, per bbl.	1.15	1.19	1.15	1.19	1.15	1.19
CHICAGO DISTRICT (Based on Group 3)—						
22-26 Fuel Oil, Group 3, bbl.	.60	.65	.60	.65	.60	.65
18-22 (Group 3), per bbl.	.52½	.67½	.52½	.57½	.55	.60
16-20 Smackover, per bbl.	.85	.90	.85	.90	.85	.87½
32-36 Gas Oil, zero	.02⅝	.02⅞	.02⅝	.02⅞	.02⅝	.02⅞
32-36 Gas Oil (industrial)	.02⅜	.02½	.02⅜	.02½	.02⅜	.02⅝
36-38 Distillate	.03¼			.03¼	.03⅛	.03⅜
38-40 Straw Distillate	.03⅜	.03½	.03⅜	.03½	.03¼	.03½

*Bunker.

LUBRICATING OIL AND WAX

	Nov. 20		Nov. 13		Nov. 6	
OKLAHOMA (Group 3)—						
100 vis., 2 color, 20-25 cold test	.06	.06¼	.06¼	.06½	.06¼	.06½
100 vis., 3 color, 20-25 cold test	.06		.06	.06¼	.06	.06¼
150 vis., 3 color, 20-25 cold test	.08	.08¼	.08¼	.08½	.08¼	.08½
150 vis., 4 color, 20-25 cold test	.08		.08	.08¼	.08	.08¼
180 vis., 3 color, 23-28 cold test	.09¼	.09½	.09⅜	.10	.09⅜	.10
180 vis., 4 color, 23-28 cold test	.09	.09¼	.09¼	.09⅜	.09¼	.09⅜
180 vis., 5 color, 23-28 cold test	.09	.09¼	.09⅛	.09½	.09⅛	.09½
200 vis., 3 color, 23-28 cold test	.09¼	.09½	.09½		.09½	
200 vis., 4 color, 23-28 cold test	.09⅛	.09¼	.09⅜		.09⅜	
200 vis., 5 color, 23-28 cold test	.09	.09¼	.09¼		.09¼	
240 vis., 3 color, 25-30 cold test	.13½	.13¾	.13¾		.13¾	
240 vis., 4 color, 25-30 cold test	.13	.13¼	.13¼		.13¼	
240 vis., 5 color, 25-30 cold test	.12	.12¼	.12¼		.12¼	
280 vis., 3 color, 25-30 cold test	.15¼	.15½	.15½		.15½	
280 vis., 4 color, 25-30 cold test	.14¾	.15	.15		.15	
280 vis., 5 color, 25-30 cold test	.13¾	.14	.14		.14	
Cylinder Stocks:						
600, steam refined, light green	.08	.09	.08	.09	.08	.09
600, steam refined, dark green	.06	.06½	.06	.06½	.06	.06½
190-200 vis. @ 210 Bright Stock	.29	.30	.29	.30	.29	.30
150-160 vis. @ 210 Bright Stock	.25		.25		.25	
Waxes:						
124-126 White Crude Scale Wax	.05	.05¼	.05	.05⅛	.05	.05¼
PENNSYLVANIA—						
34 Neutral	.07½	.07¾	.07½	.07¾	.07½	.07¾
34 Sundebloom	.08¼	.08½	.08¼	.08½	.08¼	.08½
36 Miners' Neutral	.07	.07½	.07	.07½	.07	.07½
150, 3 color	.20½	.21	.20½	.21	.21	.21½
180, 3 color	.24½	.25	.24½	.25	.25	.25½
200, 3 color	.27½	.28	.27½	.28	.28	.28½
220, 3 color	.30½	.31	.31½	.32	.30½	.31
600, steam refined	.15	.15½	.14	.14½	.14	.14½
635, steam refined	.17	.17½	.15½	.16	.15½	.16
650, steam refined	.18½	.19	.17½	.18½	.17½	.18½
600, Pennsylvania flash	.21½	.22	.21½	.22	.21½	.22
*550, E filtered	.15	.15½	.15	.15½	.15	.15½
*600, E filtered					.19	.19½
600, E filtered	.18	.18½	.18	.18½	.18	.18½
600, D filtered	.24½	.25	.24½	.25	.24½	.25
550, E filtered	.15½	.16	.15½	.16	.15½	.16
550, D filtered	.21½	.22	.21½	.22	.21½	.22
Pennsylvania Bright Stock	.33	.33½	.33	.33½	.33	.33⅜
†122-124 White Crude Scale Wax	.05¼	.05⅜	.05¼	.05⅜	.05¼	.05⅜
†124-126 White Crude Scale Wax	.05⅜	.05½	.05⅜	.05½	.05⅜	.05½

*At Warren, Pa. †At New York.

GULF COAST (South Texas)—						
No. 2 color, 100 vis., pale oil	.06½	.07	.06½	.07	.06½	.07
No. 3 color, 200 vis., pale oil	.08½	.09	.08½	.09	.08½	.09
No. 3 color, 300 vis., pale oil	.11	.11½	.11	.11½	.11	.11½
No. 3½ color, 500 vis., pale oil	.12½	.13	.12½	.13	.12½	.13
No. 4 color, 750 vis., pale oil	.15	.15½	.15	.15½	.15	.15½
No. 5 to 6 color, 200 vis., red oil	.08¼	.08½	.08¼	.08½	.08¼	.08½
No. 5 to 6 color, 300 vis., red oil	.09¼	.09½	.09¼	.09½	.09¼	.09½
No. 5 to 6 color, 500 vis., red oil	.10½	.11½	.10½	.11½	.10½	.11½
No. 5 to 6 color, 750 vis., red oil	.13¼	.14	.13¼	.14	.13¼	.14
No. 2½ color, 200 vis., pale filtered	.11¾	.12¼	.11¾	.12¼	.11¾	.12¼
No. 2½ color, 300 vis., pale filtered	.13½		.13½		.13½	
No. 2½ color, 500 vis., pale filtered	.15½	.16	.15½	.16	.15½	.16
No. 2½-3 color, 750 vis., pale filtered	.18	.20	.18	.20	.18	.20
CALIFORNIA—						
130 vis., 2½-3 color	.10¼	.11	.10¼	.11	.10¼	.11
200 vis., 2½-3 color	.11½	.12	.11½	.12	.11½	.12
300 vis., 3-3½ color	.13	.13½	.13	.13½	.13	.13½
350 vis., 3½-4 color	.13½	.14	.13½	.14	.13½	.14

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

400 vis., 3½-4 color	.15	.16	.15	.16	.15	.16
Red Neutral:						
300 vis., 4½-5 color	.11½	.11¾	.11½	.11¾	.11½	.11¾
300 vis., 5-6 color	.11¾	.12½	.11¾	.12½	.11¾	.12½
400 vis., 5-6 color	.13½	.14½	.13½	.14½	.13½	.14½
500 vis., 4½-5 color	.15	.15½	.15	.15½	.15	.15½
500 vis., 5-6½ color	.15¼	.15¾	.15¼	.15¾	.15¼	.15¾
600 vis., 6½ plus color	.15½	.16	.15½	.16	.15½	.16

Note: Bright stocks are not manufactured commercially on the Pacific Coast.

NEW YORK (BAYONNE) REFINERY PRICES

	Nov. 20	Nov. 13	Nov. 6
Gasoline, U. S. Motor, 58-60 437	.11	.11	.11
Kerosene, water white, 41-43	.09	.09	.09
*Fuel Oil, Bunker "C," 14-16, per bbl.	1.05	1.05	1.05
*Fuel Oil, Diesel, 28-30, per bbl.	2.00	2.00	2.00
Gas Oil, 32-36 gravity	.05¼	.05¼	.05¼
25 pale Paraffin Oil	.11¾	.11¾	.11¾
28 pale Paraffin Oil	.07½	.07½	.07½
285 red Paraffin Oil	.11½	.11½	.11½
250 red Paraffin Oil	.11	.11	.11
225 red Paraffin Oil	.09½	.09½	.09½
200 red Paraffin Oil	.09	.09	.09
Refined Wax:			
120-122 a.m.p., per lb.	.05¾	.05¾	.05⅝
125-127 a.m.p., per lb.	.05⅞	.05⅞	.05⅞
130-132 a.m.p., per lb.	.06¾	.06¾	.06⅝
133-135 a.m.p., per lb.	.07⅜	.07⅜	.07⅜
135-137 a.m.p., per lb.	.07¾	.07¾	.07¾
Petrolatum, in bbls., carload lots, per lb.:			
Dark green	.02	.02	.02
Amber	.03½	.03½	.03½
Extra amber	.03¾	.03¾	.03¾
Cream	.06½	.06½	.06¼
Lily white	.07½	.07½	.07¼
Snow white	.08½	.08½	.08¼

*Lighterage, 5.0c a barrel extra. †Lighterage, 6.5c a barrel extra.

NEW YORK (BAYONNE) EXPORT PRICES

	Nov. 20	Nov. 13	Nov. 6
Gasoline, U. S. Motor, 58-60 437, in cases	.2640	.2640	.2640
Kerosene, standard white, in cases	.1765	.1765	.1765
Kerosene, water white, in cases	.1890	.1890	.1890
300, steam refined cylinder stocks, in bbls.	.22½	.21	.21
335, steam refined	.23½	.22	.22
350, steam refined	.26	.24	.24
100, Pennsylvania flash	.26	.26	.26
130, Pennsylvania flash	.34½	.34½	.34½
100, Warren E.	.25½	.25½	.25½
100, Oil City E	.24½	.24½	.24½
Light 140-150 Bright Stocks	.42	.40	.40
Dark 140-150 Bright Stocks	.40½	.39	.39

LOS ANGELES EXPORT PRICES

	Nov. 20		Nov. 13		Nov. 6	
Kerosene, water white	.05¼	.06¼	.05¼	.06¼	.05¼	.06¼
U. S. Motor Gasoline, 53-55, 437 e.p.	.08¼	.09	.08¼	.09	.08¼	.09

CALIFORNIA CRUDE OIL PRICES

Standard Oil Co.-Union Oil Co. (Effective August 15, 1928)*

Gravity—	1 Richfield, Torrance, Olinda-Brea, Alamitos Hts., Signal Hill, Seal Beach, Huntington Beach, Athens, Rosecrans-Dom'gues, Inglewood	2 Whittier, La Habra, Coyote Hills	3 †Kern River, Newhall-McKittrick, Midway-Sunset, Elk Hills, Lost Hills, Belridge, Buena Vista Hills	4 Montebello	5 Santa Fe Springs	6 Coalinga	7 Wheeler Ridge	8 Orcutt	9 Ventura
10 to 14.9	.85	.85	.75	.85	....	.75	.75	.85	.85
15 to 15.9	.85	.85	.75	.85	....	.75	.75	.85	.85
16 to 16.9	.85	.85	.75	.85	....	.75	.75	.85	.85
17 to 17.9	.85	.85	.75	.85	....	.75	.75	.85	.85
18 to 18.9	.85	.85	.75	.85	....	.75	.75	.85	.85
19 to 19.9	.85	.85	.75	.85	....	.75	.75	.85	.85
20 to 20.9	.85	.85	.77	.86	....	.77	.77	.85	.85
21 to 21.9	.89	.88	.79	.89	.89	.79	.79	.86	.86
22 to 22.9	.93	.91	.82	.92	.92	.82	.82	.87	.87
23 to 23.9	.97	.94	.86	.95	.95	.85	.85	.90	.90
24 to 24.9	1.01	.97	.90	.98	.98	.88	.88	.93	.94
25 to 25.9	1.05	1.00	.95	1.01	1.01	.91	.91	.96	.98
26 to 26.9	1.09	1.04	1.00	1.04	1.04	.94	.94	.97	1.02
27 to 27.9	1.13	1.08	1.05	1.07	1.07	.98	.97	....	1.06
28 to 28.9	1.17	1.12	1.10	1.10	1.10	1.02	....	....	1.10
29 to 29.9	1.21	1.16	1.16	1.13	1.15	1.06	....	....	1.14
30 to 30.9	1.25	1.20	1.22	1.16	1.20	1.10	....	....	1.18
31 to 31.9	1.30	....	1.28	....	1.25	1.14	....	....	1.23
32 to 32.9	1.35	....	1.34	....	1.30	1.18	....	....	1.28
33 to 33.9	1.41	....	1.40	....	1.35	1.22	....	....	....
34 to 34.9	1.47	....	1.46	....	1.40	1.26	....	....	....
35 to 35.9	1.53	....	....	....	1.45	1.30	....	....	....
36 to 36.9	1.59	....	....	....	1.50	....	....	....	....
37 to 37.9	1.65	....	....	....	1.55	....	....	....	....
38 to 38.9	1.71	....	....	....	1.60	....	....	....	....
39 to 39.9	1.77	....	....	....	1.65	....	....	....	....
40 to 40.9	1.83	....	....	....	....	....	....	....	....
41 to 41.9	1.89	....	....	....	....	....	....	....	....
42 to 42.9	1.95	....	....	....	....	....	....	....	....

*Column 1—Signal Hill, Seal Beach, Huntington Beach and Alamitos Heights crude, 14 to 32.9 gravity, inclusive; Richfield, Olinda-Brea and Fullerton, 14 to 30.9 gravity; Torrance and Inglewood, 14 to 28.9 gravity. Dominguez and Athens-Rosecrans, 24 to 42.9 gravity.
Column 2—Whittier crude, 14 to 22.9 gravity; Coyote Hills, 14 to 30.9 gravity.
Column 3—Kern River, Newhall and McKittrick, 14 to 19.9 gravity; Midway-Sunset, Buena Vista and Elk Hills, 14 to 33.9 gravity; Lost Hills, 14 to 34.9 gravity.
Columns 6 and 9 posted by Union Oil Co. only.
†On October 2 Standard Oil Co. of California discontinued contracting for purchase of Kern River crude and on October 20 established following prices on grades below 14 gravity 11 to 11.9 degrees at 45 cents, 12 to 19 degrees at 50 cents.

CRUDE OIL GRAVITY TABLE

Gravity—	1 Okla., Kans., N. C. Tex.	2 No. La. and Arkansas	3 Smackover, Ark.	4 Stephens, Ark.	5 Gray County (Texas Panhandle)	6 Salt Creek, Wyo.	7 Grade B & Light Crude (G. Coast)	8 Somerset (South Central Texas)
24 and above	....	....	.90	....	....	....	....	....
Below 24	....	....	.75	....	....	....	....	....
Below 25	.60	....	....	....	....	....	1.15	....
25 to 25.9	.67	....	....	....	....	....	....	....
Below 26	....	....	....	....	....	....	....	....
26 to 26.9	.74	....	....	....	....	....	1.19	....
27 to 27.9	.81	....	....	....	....	....	1.21	....
Below 28	....	.81	....	.75	.68	....	....	....
28 to 28.9	.88	.88	....	.77	.68	....	1.23	....
29 to 29.9	.95	.95	....	.79	.75	.95	1.25	....
30 to 30.9	1.02	1.02	....	.81	.82	1.02	1.27	....
31 to 31.9	1.09	1.09	....	.83	.89	1.09	1.29	....
32 to 32.9	1.16	1.16	....	.85	.96	1.16	1.31	1.05
33 to 33.9	1.21	1.21	....	....	1.01	1.21	1.33	1.07
34 to 34.9	1.26	1.26	....	....	1.06	1.26	1.35	1.09
35 to 35.9	1.31	1.31	....	....	1.11	1.31	1.37	1.11
36 to 36.9	1.36	1.36	....	....	1.16	1.36	....	1.13
37 to 37.9	1.41	1.41	....	....	1.31	1.41	....	1.15
38 to 38.9	1.46	1.46	....	....	1.26	....	....	1.17
39 to 39.9	1.51	1.51	....	....	1.31	....	....	....
40 to 40.9	1.56	1.56	....	....	1.36	....	....	....
41 to 41.9	1.61	1.61	....	....	1.41	....	....	....
42 to 42.9	1.66	1.66	....	....	1.46	....	....	....
43 to 43.9	1.71	1.71	....	....	1.51	....	....	....
44 and above	1.76	1.76	....	....	1.56	....	....	....

Column 1—Magnolia Petroleum Co. posted schedule August 2, 1928, making price below 25 gravity 60 cents per barrel, 25-25.9 gravity 67 cents, 26-26.9 gravity 74 cents, and 27-27.9 gravity 75 cents, 30-30.9, 90 cents, and 31-31.9, $1.05, with balance of the price schedule as shown.

Oklahoma—Prairie Oil & Gas Co., Sinclair Oil & Gas Co., Gypsy Oil Co., Carter Oil Co., The Texas Company, July 26.

North Central Texas—[Including Ranger, Mexia, Powell, Richland, Wortham, Lytton Springs (Southwest Texas, Iatan and Panola (Iatan posted at flat price of 93 cents by Magnolia on January 14, 1928).] Currie, Nocona and Moran. Prairie, Sinclair and Gulf; The Texas Company, Humble Oil & Refining Co., July 26.

Kansas—Prairie, Sinclair; Carter, The Texas Company, July 26.

Column 2—Arkansas and North Louisiana—[Caddo, Bull Bayou, Crichton, De Soto, Haynesville, Homer and El Dorado only], Standard Oil Co. of Louisiana, Louisiana Oil Refining Co., and Gulf Refining Co., August 2. Magnolia Petroleum Co. schedule effective August 7 applies to Pine Island, Haynesville, Bull Bayou, Louisiana, and El Dorado, Ark., light crude. The Texas Company August 8 posted prices below 28 gravity at 7 cents differential per degree with minimum of 60 cents for all below 25 gravity.

Column 3—February 6, Louisiana Oil Refining Co. February 7, Standard Oil Co. of Louisiana, The Texas Company, Gulf Refining Co., Magnolia Petroleum Co. February 8, and on February 10, Atlantic Production Co.

Column 4—Atlantic Oil Producing Co., Louisiana Oil Refining Corp., August 3.

Column 5—Humble Oil & Refining Co., July 26.

Column 6—Midwest Refining Co., July 26. All crude over 37 gravity, $1.41 per barrel.

Column 7—Humble Oil & Refining Co. and other major buyers (schedule ends 35 and above), March 14, with exception of Magnolia Petroleum Co., which stops at 31 degrees gravity. Sun Pipe Line Co. and The Texas Company posted 2 cents differential for each degree above 35 gravity and $1.47 for 40 gravity and above.

Column 8—Grayburg Pipe Line Co. and Pioneer Oil & Refining Co., April 7.

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

Corsicana heavy (March 14, 1927)*....$1.00
Other fields....See gravity table

*Posted by Magnolia Petroleum Co.

TEXAS PANHANDLE
Carson and Hutchinson

Below 32 gravity	$ .69
32-32.9	.76
33-33.9	.81
34-34.9	.86
35-35.9	.91
36-36.9	.96
37-37.9	1.01
38-38.9	1.06
39-39.9	1.11
40-40.9	1.16
41-41.9	1.21
42-42.9	1.26
43-43.9	1.31
44 and above	1.36

Wheeler County

Below 30 gravity	$ .65
30-30.9	.75
31-31.9	.79
32-32.9	.86
33-33.9	.91
34-34.9	.96
35-35.9	1.01
36-36.9	1.06
37-37.9	1.11
38-38.9	1.16
39-39.9	1.21
40-40.9	1.26
41-41.9	1.31
42-42.9	1.36
43-43.9	1.41
44 and above	1.46
Gray County	See gravity table

Humble Oil & Refining Co. and Magnolia Petroleum Co., July 26.

Iatan*....Same as North Texas
Crane-Upton-Crockett, Pecos, Winkler and Glasscock (July 26)‡....$ .65
Chalk†....80

*Includes Howard County and Westbrook Fields, Marland Refining Co. pays $1.05 for Howard County crude, effective May 21.
†Magnolia Petroleum Co., January 14, 1928.
‡Posted by Humble Oil & Refining Co., Magnolia Petroleum Co. and Gulf Pipe Line Co.

ARKANSAS-NORTH LOUISIANA

Cotton Valley (Below 36 gravity April 11)....$ .75
Bellevue (Feb. 27, 1927)....1.25
Urania (Oct. 16, 1928).....90
East El Dorado (March 16, 1927)....1.50
Other fields....See gravity table

*Cotton Valley crude above 36 gravity takes same gravity price schedule as shown for North Louisiana and Arkansas crude in Mid-Continent gravity price table.

Note—Cotton Valley and Bellevue, Standard Oil Co. of Louisiana, Louisiana Oil Refining Co., Gulf Refining Co. and Magnolia Petroleum Co.; (Magnolia Petroleum Co. posted Cotton Valley February 8); Urania, Louisiana Oil Refining Corp.; East El Dorado, Magnolia Petroleum Co., Gulf Refining Co.

GULF COAST

(Goose Creek, Hull, Liberty, West Columbia, Orange, Boling, Sour Lake, Humble, Sugarland, Raccoon Bend, High Island, Pierce Junction and Spindletop.)

Grade A (March 14)*....$1.30
Grade B....See gravity table
Jennings, La. (March 14)†....$1.05
Saratoga, Batson, Daytona (March 14, 1927)‡....1.20
Markham (March 14)‡....1.00

*Humble Oil & Refining Co. and other major buyers. †Gulf Pipe Line Co. ‡Sun Pipe Line Co. §The Texas Company.

SOUTH CENTRAL AND SOUTH-WESTERN TEXAS

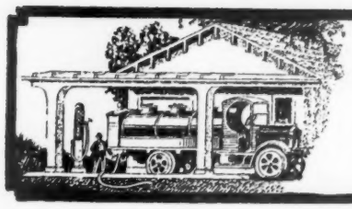
Luling (May 5)*....$1.00
Mirando (March 14)†....1.00
Rockdale-Minerva (April 16):
Below 38 gravity....1.25
38-38.9 gravity....1.27
39-39.9 gravity....1.29
40 and above....1.31
Thrall‡....
Callihan (May 15)....1.75
Lytton Springs (Lockhart)....See gravity table
Somerset....See gravity table

*Posted by Magnolia Petroleum. Thrall prices same as North Central Texas less 19½ cents per cwt. freight.
†Magnolia Petroleum Co., Humble Oil & Refining Co., Crown Central Pipe Line Co.

ROCKY MOUNTAIN STATES
Ohio Oil Co.-Midwest Refining Co.
(Effective July 27, 1928)

Rock Creek, Wyo....$1.33
Salt Creek....See gravity table

(Continued on Page 134)



TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns Nov. 20.

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO. (INDIANA)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Chicago dist.	15.0	17.0	...	12.0
Decatur, Ill.	15.2	15.0	...	12.1
East St. Louis	14.4	16.4	...	11.2
Joliet	15.4	17.4	...	12.3
Peoria	15.2	15.0	...	12.1
Quincy	15.2	17.2	...	11.9
Davenport, Ia.	18.5	20.5	3.0	12.3
Des Moines	18.5	20.5	3.0	12.3
Keokuk	18.5	20.5	3.0	12.3
Sioux City	18.1	20.1	3.0	11.9
Duluth, Minn.	18.5	20.5	2.0	12.9
Mankato	18.1	20.1	2.0	12.7
Minneapolis	18.2	20.2	2.0	12.9
La. Crosse, Wis.	18.2	20.2	2.0	13.0
Milwaukee	17.1	19.1	2.0	11.9
Madison	17.3	17.3	2.0	12.1
Detroit, Mich.	18.8	20.8	3.0	13.7
Grand Rapids	18.7	20.7	3.0	13.6
Saginaw	18.9	20.9	3.0	13.8
Evansville, Ind.	18.0	20.0	3.0	13.0
Fort Wayne	18 4	18.4	3 0	13.4
Indianapolis	18.2	20.2	3.0	13.2
South Bend	18.4	20.4	3.0	13.4
Fargo, N. D.	19.9	21.9	2.0	14.9
Huron, S. D.	20.3	22.3	4.0	13.7
Sioux Falls	19.1	21.1	4.0	13.4
K. C., Mo.*	17.9	17.9	3.0	10.6
Springfield*	17.8	19.8	3.0	11.5
St. Louis*	16.9	16.9	2.5	11.3
St. Joseph*	17.5	19.5	3.0	11.2
Wichita, Kans.	15.8	17.8	2.0	10.8
Bartlesville, Ok.	16.5	18.5	3.0	10.5

*State tax 2 cents; remainder city tax.

NAPHTHA

	Tank wagon	Tank car
Oleum spirits	14.7	12.9
V. M. & P. naphtha	16.2	13.9
Cleaner's naphtha	18.0	14.9
Stanisol	19.0	15.4

Tank wagon prices f.o.b. Chicago; tank car prices f.o.b. Whiting.

STANOLIND FURNACE OIL IN CHICAGO

Less than 100 gallons	9.0
100 to 799 gallons	8.0
800 or more gallons	7.5

Note—Outside Chicago furnace oil discount of 1 cent per gallon is given on deliveries of 100 to 349 gallons and 1½ cents on deliveries of 350 gallons or more.

The following quantity discounts from the service station price are allowed on monthly sales of gasoline: 2,000 gallons or less, 2 cents; more than 2,000 and less than 6,000 gallons, 2½ cents; more than 6,000 gallons, 3 cents. Discounts are allowed each month, and they are not cumulative. Delivery tickets showing date and quantity delivered must be sent to the seller before the tenth of the month to secure the discount on the previous month's purchases.

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Dallas, Tex.	16.0	20.0	2.0	12.0
Fort Worth	16.0	19.0	2.0	13.0
Houston	16.0	20.0	2.0	15.0
San Antonio	14.0	17.0	2.0	11.0
El Paso	17.0	20.0	2.0	16.0
Texarkana	16.5	20.5	2.0	13.0
Muskogee, Ok.	18.0	20.0	3.0	13.0
Okla. City	18.0	20.0	3.0	12.0
Tulsa	17.0	19.0	3.0	10.0
Ft. Smith, Ark.	18.0	20.0	3.0	14.0
Little Rock	21.0	23.0	5.0	14.0

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Omaha	17.25	19.25	2.0	12.25
McCook	18.75	20.75	2.0	13.75
Norfolk	17.75	19.75	2.0	12.75
N. Platte	18.75	20.50	2.0	13.50
Scotsbluff	18.75	20.75	2.0	13.25

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Denver, Colo.	19.0	22.0	3.0	14.5
Pueblo	19.0	22.0	3.0	14.5
Grand Junction	22.5	25.5	3.0	18.0
Casper, Wyo.	19.0	22.0	3.0	13.0
Cheyenne	20.0	23.0	3.0	14.5
Butte, Mont.	23.5	26.5	3.0	19.0
Helena	23.5	26.5	3.0	19.0
Salt Lake, Utah	22.0	25.0	3.5	17.0
Albu'que, N. M.	22.0	25.0	5.0	17.0
Boise, Idaho	24.5	27.5	4.0	19.0
Twin Falls	24.5	27.5	4.0	19.0

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Atlanta, Ga.	22.0	24.0	4.0	16.5
Augusta	22.0	24.0	4.0	15.5
Macon	22.0	24.0	4.0	16.5
Savannah	21.0	21.0	4.0	14.5
Birm'ham, Ala.	22.0	24.0	4.0	14.0
Mobile	22.0	24.0	4.0	15.0
Montgomery	21.0	22.0	4.0	16.5
Clarks'le, Miss.	21.0	23.0	4.0	13.0
Jackson	19.0	21.0	4.0	14.5
Natchez	20.5	22.5	4.0	14.0
Gulfport	22.5	24.5	4.0	14.0
Vicksburg	20.5	22.5	4.0	14.0
Jack'ville, Fla.*	22.0	24.0	5.0	13.5
Miami*	23.0	25.0	5.0	15.5
Pensacola*	24.0	26.0	5.0	13.5
Tampa*	22.0	24.0	5.0	13.5
Lexington, Ky.	21.0	23.0	5.0	15.5
Covington	22.0	22.0	5.0	15.5
Louisville	21.0	23.0	5.0	15.0

*Note—Florida station prices have been 2 cents above tank wagon prices in respective points since July 30 as shown above.

In addition to the state tax of 4 cents on gasoline, Montgomery has city tax of 1 cent on gasoline. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene only. Pensacola tax includes 1-cent city levy. Gulf port tax includes privilege tax of 2 cents in addition to state tax.

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Atlantic City	18.0	20.0	2.0	14.0
Newark, N. J.	18.0	20.0	2.0	14.0
Annapolis, Md.	21.0	23.0	4.0	14.0
Baltimore	21.0	23.0	4.0	11.0
Cumberland	21.0	23.0	4.0	14.0
Washington	19.0	21.0	2.0	14.0
Danville, Va.	22.0	...	5.0	14.0
Norfolk	19.0	20.0	5.0	14.0
Petersburg	22.0	24.0	5.0	14.0
Roanoke	22.0	24.0	5.0	14.0
Richmond	22.0	24.0	5.0	14.0
Ch'rlst'n, W. V.	21.0	23.0	4.0	14.0
Keyser	21.0	23.0	4.0	14.0
Parkersburg	21.0	23.0	4.0	14.0
Wheeling	21.0	23.0	4.0	14.0
Charlotte, N. C.	21.0	23.0	4.0	14.0
Hickory	21.0	23.0	4.0	14.0
Mt. Airy	21.0	23.0	4.0	14.0
Salisbury	21.0	23.0	4.0	14.0
Charleston, S. C.	22.0	24.0	5.0	14.0
Columbia	22.0	24.0	5.0	14.0

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Albany, N. Y.	18.0	20.0	...	15.0
New York*	18.0	20.0	...	15.0
Buffalo	18.0	20.0	...	14.0
Rochester	18.0	20.0	...	14.0
Syracuse	18.0	20.0	...	15.0
Boston, Mass.	18.0	20.0	...	15.0
Augusta, Me.	22.9	24.0	4.0	15.0
Manch't'r, N. H.	22.0	24.0	4.0	15.0
Burlington, Vt.	21.0	23.0	3.0	15.0

*Prices in steel barrels.

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
N. Orleans, La.*	15.5	17.5	3.0	16.0
Baton Rouge	16.0	18.0	2.0	14.5
Alexandria	17.0	19.0	2.0	16.0
LaFayette	17.0	19.0	2.0	15.5
Lake Charles	17.5	19.5	2.0	16.0
Shreveport	17.5	19.5	3.0	15.0
Knoxv'le, Tenn.	21.0	21.0	3.0	16.0
Memphis	19.0	21.0	3.0	15.0
Chattanooga	20.5	22.5	3.0	16.0
Nashville	20.0	20.0	3.0	16.0
Bristol	21.0	23.0	3.0	15.0
Lit. Rock, Ark.	21.0	23.0	5.0	14.0

*Tax of 3 cents includes city tax of 1 cent. Louisiana kerosene prices include 1-cent state tax and 1-cent parish tax.

PACIFIC COAST TERRITORY

Standard Oil Co. (California)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
San Francisco	17.0	21.0	3.0	16.5
Los Angeles	16.5	20.5	3.0	16.5
Reno, Nev.	22.0	26.0	4.0	19.0
Portland, Ore.	17.5	21.5	3.0	16.5
Seattle, Wash.	16.5	20.5	2.0	16.5
Tacoma	16.5	20.5	2.0	16.5
Spokane	20.5	24.5	2.0	20.5
Phoenix, Ariz.	18.0	22.0	4.0	20.5

PENNSYLVANIA-DELAWARE AND PART NEW ENGLAND

The Atlantic Refining Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Pittsburgh, Pa.	19.0	*21.0	...	15.0
Philadelphia	16.0	*21.0	...	15.0
Scranton	16.0	*21.0	...	15.0
Allentown	16.0	*21.0	...	15.0
Altoona	16.0	*21.0	...	15.0
Erie	16.0	*20.0	...	15.0
Philadelphia	16.0	*21.0	...	15.0
Dover, Del.	19.0	21.0	3.0	15.0
Wilmington	19.0	21.0	3.0	15.0
Springf'd, Mass.	18.0	20.0	...	15.0
Worcester	18.0	20.0	...	15.0
Boston	18.0	20.0	...	15.0
Providence, R. I.	20.0	22.0	2.0	15.0
Hartford, Conn.	20.0	22.0	2.0	14.0
New Haven	20.0	22.0	2.0	15.0

*Includes tax of 3.0 cents. Pennsylvania tax is collected by the dealer and paid by him direct to the State.

OHIO

Standard Oil Co. (Ohio)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
All Ohio points	17.0	20.0	3.0	12.0

TANK WAGON CHANGES

November 12—Standard Oil Co. of Louisiana reduced gasoline service station price 2 cents at Nashville.

November 15—Standard Oil Co. of Indiana reduced gasoline service station price 2 cents at Kansas City and St. Louis.

November 17—Standard Oil Co. of Ohio reduced kerosene tank wagon price 2 cents. New price is 12 cents.

November 21—Standard Oil Co. of New Jersey announced that it would do away with all gasoline tank wagon and service station discounts. A differential of 3 cents between tank wagon and service station prices was established.

Note—the table on this page giving Standard of New Jersey service station and tank wagon prices does not include these changes as the exact prices at marketing points have not been announced.

BIG ATTENDANCE AT MARKET CONGRESS

(Continued from Page 41)

a stag smoker at the Lake Shore Athletic Club.

The leading feature on the morning program Tuesday was a staging of a solicitation for membership. The two field secretaries represented a solicitor for membership and a friendly member while a third party represented the jobber whose membership was wanted. This part was taken by the representative of a large distributor in Detroit who is actually considering membership and agreed to join if convinced. He asked numerous questions and in answering these members were asked to relate their experience with the use of the organization's emblems and the benefits received from actual membership.

The luncheon on Tuesday was divided into groups of about 20 each, according to States, two or three of the States closest by being grouped together while more distant States were included in a grouping of six or seven. This grouping revealed that there were oil men in attendance from practically all States east of the Rocky Mountains while a number of Canadian oil men were also present. The first feature on the program after the prize drawing for prompt attendance on the afternoon of Tuesday was the address by Dr. Gustav Egloff of the Universal Oil Products Co. on anti-knock fuels. The paper was given close attention and was followed by brief discussions and answering of questions from the audience. This was followed by a general discussion under the name of the marketing congress conference of which Paul Hadlick was the leader. Several group meetings each in separate rooms followed at which timely topics of practical value to the oil men were discussed.

The morning session of the third day was devoted to aviation as the chief topic. Aviation lubrication was discussed by E. F. Hallock, manager of the manufacturers' service division of the Vacuum Oil Co., while Thomas Wolfe spoke at length on air transportation in its relation to the petroleum industry. Mr. Wolfe is the president of the Chicago Air Traffic Association and district manager of the National Air Transport, Inc.

EASTERN ENGINEERS WILL MEET SATURDAY

OIL CITY, Pa., Nov. 19.—The third regular meeting of the Eastern District, American Petroleum Institute, Division of Development and Production Engineering, will be held here November 24.

The meeting, which will last the entire day, will open at 9:30 a.m. with reports of committees followed by a business session. A paper on "Air Pressure Recovery" by W. J. Brundred and one on "Band Wheel Powers" by George L. Reid will be read.

The afternoon will be devoted to visiting the plants of the Oil Well Supply Co., National Transit Co., and the Joseph Reid Gas Engine Co.

CRUDE OIL PRICES

(Continued from Page 133)

Big Muddy	1.0
Grass Creek, heavy	.9
Grass Creek, light	1.0
Mule Creek (May 1)	1.1
Elk Basin	1.0
Lance Creek	1.0
Poison Spider (March 14, 1927)	1.0
Notches (March 14, 1927)	.9
Rex Lake (February 22)	1.1
Osage	1.0
Lost Soldier (contract)	.9
Hamilton Dome (March 14, 1927)	.9
Greybull-Torchlight	1.0
Cat Creek (Montana)	1.0
Sunburst (Montana) (May 18, 1928)	1.0
Artesia	1.0
Hogback (New Mexico)	1.0

Note—Salt Creek, Osage, Cat Creek, Greybull and Hogback posted by Midwest Refining Co., and the remainder by the Ohio Oil Co. Both companies post Grass Creek light and Elk Basin.

EASTERN STATES

Joseph Seep Purchasing Agent
(Effective November 9, 1928)

Penna Grade Oil in New York Transit Lines (New York)	$3.0
Bradford District Oil in National Transit Lines (Pennsylvania)	3.0
Penna Grade Oil in National Transit Lines (Pennsylvania)	3.0
Penna Crude Oil in Southwest Pennsylvania Lines (West Virginia)	3.0
Penna Grade Oil in Eureka Pipe Line Lines (Pensylvania)	3.0
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio)	3.0
Cabell Grade Oil in Eureka Pipe Line Lines (West Virginia) (July 13)	1.0
Corning 35-cent Grade Oil in Buckeye Pipe Line Co.'s Lines (August 8)	1.7
Corning 25-cent Grade Oil in Buckeye Pipe Line Co.'s lines (August 8)	1.0
Somerset Oil in Cumberland Pipe Line Lines (Kentucky) (Sept. 14, 1928)	1.7
Ragland Grade Oil in Cumberland Pipe Line Lines (Kentucky) (August 1)	.9

MIDDLE WESTERN STATES

Ohio Oil Co.
(Effective July 27, 1928)

Lima	$1.6
Wooster (October 17)	1.7
Illinois	1.5
Indiana	1.5
Princeton	1.5
Plymouth	1.5
Waterloo (November 17, 1926)	1.5
Western Kentucky* (Sept. 17, 1928)	1.6
Saginaw, Mich., Saginaw Sand (February 10)†	1.0
Saginaw, Mich., Berea Sand (February 10)†	1.7
Cumberland, Clay, Barren, Clinton and Monroe Counties, Kentucky, (March 16)‡	1.0
Oil in lines of Stoll Oil Refining Co. in Oil City, Ky. (Oct. 1, 1928)§	1.5
Oil Springs (Canada)¶	2.0
Petrolia (Canada)¶	2.0

*Posted by Ohio Oil Co.
†Posted by Sun Oil Co.
‡Posted by Paragon Development Co.
§Posted by Stoll Oil Refining Co.
¶Posted by Imperial Oil Co., Ltd.

MEXICAN CRUDE

Panuco heavy (f.o.b. Mexican ports)	$1.5

Note—Due to the fact that the exportation of Tuxpam light crude has become a negligible factor, prices will no longer be published.

Authorized Dealer

SINCLAIR OPALINE MOTOR OIL

REG. U. S. PAT. OFF

Seals Power at every Degree of Wear

When you become an Authorized OPALINE Dealer!

REG. U.S. PAT. OFF.

... you have the exclusive Opaline method of applying motor oil.

... you ask a motorist, when he drives in, "What's your mileage?" Then you consult the Sinclair Recommendation Index and you give him the correct grade of Opaline he needs—whether his car is new, whether it has travelled 2,000 miles, 12,000 miles, or over!

... that grade of Opaline will fit the degree of *wear* in his engine. It will seal the pistons and prevent power from blowing by!

... that's the *extra* service Opaline gives a motorist — the *extra* service *YOU* give him. And he'll come back for more!

... the right *grade* of motor oil is just as important as the right *quality*. The Authorized Opaline Dealer gives a motorist *both*. May we tell you the added advantage of selling such a favorably known, nationally advertised brand?

SINCLAIR REFINING COMPANY, INC.

Also Makers of Sinclair Gasoline and H-C Gasoline

45 NASSAU STREET, NEW YORK

Atlanta Boston Chicago Houston Kansas City

© 1928 S. R. C.

Oil Securities Advance With Market

Almost Every Oil Issue Shared in Movement. Gulf Oil Reached New High. Barnsdall Was Firm. Amerada Up

By Special Correspondent

The oil stocks followed the rise which the general industrial list experienced this week in a market which went wild. On Friday of last week, the New York Exchange registered another new high with a total volume of 6,700,000 shares traded in.

The sensational advances were not confined to any special offerings, but almost every oil on the list participated in the climb. The curb group were also strong with Gulf Oil touching a new high of 157¼.

Barnsdall reacted from its last week's spurt, but appeared in strong hands, and was firm around 47½. Amerada touched new ground selling through 43. Shell Union was another offering which set a new high at 38.

The strength of the Mid-Continent crude oil situation was believed to be partially responsible for the advance of the oils, but the thoughts that they have not shared very much in the advance of the general list, and that the investing public now seems convinced the oil industry has set its house in good order for 1929 were probably the dominant reasons for the increases.

National Supply

Report of National Supply Co. of Delaware and subsidiaries, including Superior Engine Co. and Otto Engine Works, manufacturers and distributors of equipment, machinery and supplies to all branches of the oil industry, for quarter ended September 30, 1928, shows net income of $1,564,672 after charges, Federal taxes and other deductions. This is equivalent after allowance for dividend requirements on 7 per cent preferred stock to $4.80 a share (par $50) earned on 300,000 shares of common stock, and compares with $541,892 or $1.39 a share in preceding quarter and $369,322 or 92 cents a share on 265,000 shares of common in third quarter of 1927.

Net income for nine months ended September 30, including Superior Engine Co. and Otto Engine Works for six months, was $2,303,373 after above charges, equal to $6.43 a share on 300,000 common shares, against $2,094,340 or $6.47 a share on 265,000 shares of common in same period of previous year.

Current assets on September 30, last, including $8,878,573 cash and call loans, amounted to $34,555,990, and current liabilities were $3,609,937, comparing with $32,501,911 and $2,998,484, respectively, on September 30, 1927, while profit and loss surplus was $17,432,633, against $15,302,687.

Reiter-Foster

Statement of Reiter-Foster Oil Corp. as of October 31, 1928, shows total assets of $5,834,285 and profit and loss surplus of $2,216,654. Current assets were $636,195 and current liabilities $10,254.

Balance sheet as of October 31, 1928, follows: Assets: Undeveloped leaseholds, farm investment, equipment, etc., less depreciation, $4,980,768; cash, $351,471; accounts and notes receivable, $180,441; warehouse stocks, $104,283; stock in other companies, $123,518; prepaid expenses, $4,169; underwriters contract, $89,635; total, $5,834,285. Liabilities: Capital stock (represented by 388,584 no par shares, including 17,927 shares sold but unissued), $3,607,377; accounts payable, etc., $10,254; surplus, $2,216,654; total, $5,834,285.

Western Exploration

Western Exploration Co. has declared a dividend of 2½ cents payable December 20, to stockholders of record of December 15.

Lion Oil Refining

Lion Oil Refining Co. for 10 months ended October 31 reports profit of $955,184 after charges but before depreciation, depletion and Federal taxes. For the year ended December 31, 1927, the company had net income of $450,975 after charges and taxes, equivalent to $2.25 a share on 200,000 no-par shares.

Regular Solar Refining Dividend

Solar Refining Co. declared the regular semiannual dividend of $5, payable December 20 to stock of record November 30.

Shell Transport Dividend

Shell Transport & Trading Co., Ltd., declared an interim dividend of 2s a share, tax free. An interim dividend for the same amount was declared a year ago.

South Penn

South Penn Oil Co. has declared a stock dividend of 50 per cent subject to approval by stockholders at a meeting January 15. Company also declared an extra dividend of 25 cents and the regular quarterly dividend of 50 cents, both payable December 31 to stock of record December 15. In the preceding quarter an extra dividend for the same amount was declared.

Shreveport-El Dorado Pipe Line

Shreveport-El Dorado Pipe Line Co., Inc., reports for 10 months ended October 31, 1928, profit of $236,108 after taxes, interest and inventory adjustments but before reserves. Shreveport Producing & Refining Co., for 10 months ended October 31, 1928, reports profit of $390,278 after taxes, interest and inventory adjustments but before reserves. Shreveport-El Dorado Pipe Line Co., Inc., owns more than 60 per cent of Shreveport Producing & Refining Co. stock.

Royal Dutch

Advice from Amsterdam state that Royal Dutch Co. has succeeded in placing under favorable conditions an issue of its shares of nominal value of 1,800,000 florins on the Zurich, Basle and Geneva bourses. Paid up capital of Royal Dutch now totals 413,903,000 florins.

Standard Oil of New Jersey

Standard Oil Co. of New Jersey declared usual 12½ cents extra and regular quarterly dividend of 25 cents, both payable December 15 to stock of record November 26.

Northern Pipe Line

Northern Pipe Line Co. declared an initial dividend of $2 and an extra dividend of $1 on its $50 par capital stock, both payable January 2 to stock of record December 7. Par was recently reduced to $50, from $100, and a distribution of $50 in cash was made in September in connection with this reduction. Previous dividend paid on the old stock was $3 a share in July and $5 a share in January last, the latter including a $2 extra.

TWENTY REPRESENTATIVE STOCKS

The Oil and Gas Journal weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange and New York Curb was as follows:

Nov. 19	80.55	Sept. 29	67.93	Aug. 13	65.16
Nov. 12	78.27	Sept. 22	67.12	Aug. 6	66.16
Nov. 5	75.99	Sept. 15	67.06	July 30	64.68
Oct. 29	75.02	Sept. 8	66.76	July 23	64.18
Oct. 20	76.05	Sept. 1	65.96	July 16	64.51
Oct. 13	68.03	Aug. 27	65.79	July 9	65.38
Oct. 6	57.55	Aug. 20	65.42	July 2	64.17

POINT TO POINT RADIO HEARING DECEMBER 18

By Charles E. Kern

Washington Bureau, The Oil and Gas Journal

WASHINGTON, D. C., Nov. 20.—The point-to-point cases brought by oil companies before the Federal Radio Commission have been postponed until December 18. Counsel for the oil companies were present to see that the case was not called for today. This continuance was thought desirable in order to give ample time for the further preparation of individual cases.

GULF COAST MARKET

HOUSTON, Tex., Nov. 20.—Gulf Coast lubricating oil markets continued to mark time. Lack of sufficient demand to stiffen prices caused some uncertainty but sellers generally so far have been able to maintain their posted market. The past week saw an increase at some refineries in movements of the lighter viscosity oils but generally the market is quiet.

Fuel oils failed to show any improvement with the market very weak. Virtually the only business being done is in bunkering of ships moving out of the Houston Ship Channel and open demand in this is comparatively small.

INDEPENDENT OILS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Kennedy Building, Tulsa, Okla. Members New York Curb Market

1926 High	1926 Low	1927 High	1927 Low	1928 High	1928 Low	Par value	Stocks	For Week ended November 16 Sales	Open	High	Low	Last	Change
$6 75	.45	2⅞	.55	1½	.66	$5	Amer. Con. Oilfields	25,800	78	78	68	68	—8
..	..	7½	2¾	8⅞	3¼	N.P.	Amer. Maracaibo	262,400	9	9¼	8	8⅜	+ ⅛
..	..	2¾	1	4½	2¼	$10	Argo Oil	No sales.					
85¼	60	40	20½	55	32⅞	N.P.	British American	400	50	50	50	50	..
28⅜	9¼	28¼	15½	23⅞	12½	25c	Carib. Syndicate (new)	50,800	19⅞	20¼	17⅝	19⅜	— ⅛
..	..	58¾	40¼	73⅞	54	$20	Cities Service	18,200	73¾	74¾	73	73¼	— ⅛
..	..	95⅜	87	103½	94½	100	Cities Service, pfd.	1,100	99⅝	99¾	99⅝	99⅝	— ⅛
..	..	8⅞	7⅜	9⅝	8⅜	10	Cities Service, pfd. B	200	9¼	9¼	9¼	9¼	..
3½	1¾	3⅞	1⅛	2¼	1 1/16	1	Colombia Syndicate	10,500	1¼	1⅜	1 1/16	1⅜	—
..	..	9¾	6⅜	8⅛	6½	10	Consolidated Royal	200	6½	6½	6½	6½	..
16	10	14⅞	9½	17½	10	N.P.	Creole Syndicate	41,000	12¾	13	12⅛	12¼	— ⅛
..	..	3	.50	2¾	.76	N.P.	Crown Central	600	1⅝	1¾	1⅝	1¾	..
7⅞	6¾	12	4	31	8⅛	N.P.	Darby Petroleum	3,100	29¼	29⅛	27½	28⅜	— ⅛
..	..	2½	.74	2⅛	1	N.P.	Derby Oil & Refining	100	1¾	1¾	1¾	1¾	—
..	..	16¾	4	21	7½	N.P.	Derby Oil & Refining, pfd.	No sales.					
..	..	2	.40	.53	.15	N.P.	Gilliland ctfs.	No sales.					
98	92	118	86¼	148½	101⅛	$25	Gulf Oil Corp.	15,900	139⅛	148	138¼	144⅜	+4⅜
$3 00	83	2½	.80	2¾	1	10	Intercontinental Pet.	40,900	1¾	2	1⅝	1⅝	— ⅛
..	..	2¼	1⅛	3	1¼	N.P.	Kirby Petroleum	700	2½	2¾	2½	2½	+ ⅛
12¼	5¾	10⅞	5⅛	9⅜	5⅛	N.P.	Leonard Oil & Dev.	1,600	5⅜	7	5½	6	+ ⅛
27	20	27½	20	40⅛	20	N.P.	Lion Oil & Refining	8,300	38¼	40	36⅝	40	—2
46	30	59¾	37	65	49	$25	Lone Star Gas	50,000	65	65⅞	63	64½	— ⅛
2⅞	1	2⅞	.80	1⅞	.50	1	Magdalena Syndicate	376,000	....	74	61	70	...
34	12½	52	12	45	34½	N.P.	Margay Oil	No sales.					
8	5½	12¼	5	8	4¼	N.P.	Mexico-Ohio Oil	2,200	3¼	3⅜	2¾	3¾	...
1¾	1⅛	1½	1	1½	.81	$1	Mountain & Gulf	3,900	1¼	1¼	1⅛	1¼	...
26	23	29¼	22¾	28⅝	21½	10	Mountain Producers	11,000	22⅛	22⅜	22⅛	22¼	+ ⅛
6⅝	5	5⅞	4⅝	5⅝	4¼	5	New Bradford	2,300	4¾	4¾	4⅝	4¾	...
..	..	16	9¼	11⅜	7⅛	1	New Mex. & Ariz.	5,200	8	9¼	8	8⅞	—⅛
..	..	12¾	9½	13¼	10⅜	N.P.	North Central Texas	100	10½	10½	10½	10½	+ ⅛
10⅛	5⅞	9⅜	3¼	6	2¼	N.P.	Pandem	16,900	2⅞	3⅝	2½	3½	+ ⅛
12¼	11¾	12⅛	7	15⅝	8½	N.P.	Pantepec Oil	13,700	12	12¼	11¼	11½	— ⅛
22¾	12	13½	5⅛	7¾	5⅛	$10	Pennok Oil	1,700	6¼	6½	5¾	5¾	+ ⅛
17	8½	24⅜	7	14½	9	25	Red Bank Oil	500	9	9	9	9	...
30¼	12	15½	3½	12⅞	4⅓	N.P.	Reiter-Foster	18,000	9⅝	9⅞	8⅞	9¾	+1
7	4½	7	4½	10½	4⅝	N.P.	Ryan Consolidated	9,900	10	10½	8⅞	9	—1⅛
10	7⅛	8	5¼	7¼	5⅜	$10	Salt Creek Cons.	100	5⅞	5⅞	5⅞	5⅞	...
35	24⅛	35½	27¼	35	23¼	10	Salt Creek Prod.	14,800	26½	26⅞	26	26	— ⅛
6⅞	1¾	7	1¾	3½	1	5	Savoy Oil	No sales.					
27	7⅝	26½	17	22⅞	13	10	Tidal Osage	500	16⅝	17	16⅝	16⅞	+ ⅛
25¾	7⅝	23¾	15	21¼	13⅛	10	Tidal Osage, nonvoting	1,900	15½	15½	14¾	15½	+ ⅛
92	63½	92	63½	88	75	100	Transcontinental, pfd.	1,300	89	90⅞	87	89¾	+1⅛
8	4½	7⅜	4¼	8¼	4⅞	5	Venezuelan Petrol	18,400	7¾	7¾	7¼	7¼	+ ⅛
8⅛	5½	8	4¾	8¼	4⅞	$1	Woodley Petroleum	500	5½	5⅞	5⅜	5¾	..
6½	6	6	1¾	8⅜	2⅛	25	Y Oil & Gas (new)	5,000	6¼	6¾	5¼	5¼	—1⅛

*Ex-dividend.

TRANSACTIONS IN OIL SHARES ON NEW YORK STOCK EXCHANGE

Quotations Compiled by Francis, Bro. & Co., Members New York Stock Exchange, Kennedy Building, Tulsa, Okla.

1926 High	1926 Low	1927 High	1927 Low	1928 High	1928 Low	Listed capital	Par value	Stocks—	Div. rate	Last paid	Transactions week ended November 17 Sales	Open	High	Low	Last	Change
32⅞	24¼	37⅝	27⅝	40¾	27⅛	(sh) 922,075	N.P.	Amerada Corp.	50cQ	Oct. 31, 28	478	39½	39⅞	37	39⅛	+ ½
74	39⅞	82½	35⅛	85	51¼	(sh) 209,180	N.P.	American Republics Corp.	.....	.....	234	72⅜	75⅞	69⅛	74⅝	+ 4⅜
60	44¾	50¼	35	53⅜	37½	$56,000,000	$25	Associated Oil	50eQ	Sept. 29, 28	170	47⅛	50	47	47	— 2
128⅜	97	131⅜	104	239⅝	95¾	50,000,000	25	Atlantic Refining	25cQ	Sept. 15, 28	1,926	54⅞	57	54⅛	55¼	— 1⅛
31½	23½	35½	20¾	51⅞	20	28,725,675	25	Barnsdall Corp. A	50cQ	Oct. 31, 28	3,307	52⅝	53	46⅝	48	— 3⅞
94¼	50	96¾	65	94⅞	68	20,785,400	100	General Asphalt	.....	.....	203	75⅝	79½	73½	74½	+ ¼
72	50¼	175¾	60⅛	167	119	25,000,000	100	Houston Oil	.....	.....	88	136	137	131	137	+ 2
34	19⅝	32¾	17⅝	34⅜	21¾	(sh) 500,000	N.P.	Independent Oil & Gas	37½eQ	Oct. 31, 28	690	35	37½	34⅞	37⅜	+ 2⅞
12¾	7½	12⅛	7⅝	39⅝	9	$3,280,340	$10	Indian Refining	.....	May 31, 24	481	36⅜	36½	33½	34⅝	— 1¼
25⅞	16½	37¾	20½	39⅛	27⅜	(sh) 3,992,122	N.P.	Lago Oil & Transport	.....	May 1, 27	No sales.					
19⅝	12	18⅛	10	19¾	9⅜	(sh) 1,237,078	N.P.	Louisiana Oil Refining	.....	.....	430	18¾	18⅞	17⅛	17⅛	— 1⅜
28	16½	22¾	12	25½	12½	(sh) 330,000	N.P.	Maracaibo Oil	.....	.....	120	19⅞	20½	18⅝	19⅛	+ ⅜
63⅜	49¼	58½	31	47⅜	33	(sh) 2,316,692	N.P.	Marland Oil Co.	.....	Mar. 31, 27	875	46⅝	47	45¼	47⅛	+ ⅛
13¾	6	9¼	3	42⅛	4⅝	(sh) 945,939	N.P.	Mexican Seaboard	.....	Dec. 15, 20	3,399	52	70	51⅜	68	+17⅝
37	20½	39⅜	25½	39⅞	25⅛	(sh) 1,357,461	N.P.	Mid-Continent Petroleum	.....	Aug. 1, 27	1,625	38⅞	40⅞	38½	39	+ ½
104¼	90	105	97	115⅛	103¼	$6,718,000	$100	Mid-Continent Petroleum pfd.	$1.75Q	Sept. 1, 28	No sales.					
2½	½	3¾	1⅝	7⅜	2⅜	24,298,850	10	Middle States	.....	July 1, 23	431	6⅜	6½	5⅞	6¼	.....
76½	56⅛	65⅞	40⅛	55	38¼	$48,807,400	$50	Pan American P. & T.	.....	Oct. 20, 27	106	53	53¾	51⅞	51⅞	— ⅛
78⅝	56⅞	66⅜	40¼	58⅞	37¾	121,097,900	50	Pan American P. & T. B	.....	Nov. 15, 24	914	56¾	56¾	53½	55	— ½
46	30	37⅞	16¾	28⅜	15½	(sh) 400,000	N.P.	Pan American Western B	.....	Jan. 30, 27	43	17⅞	19	17⅝	18½	+ ½
22	4½	18⅞	8	21⅜	11½	(sh) 198,770	N.P.	Panhandle P. & R.	.....	.....	56	17⅜	17⅜	15¼	15½	— 1⅝
99⅜	51	83	54	106¼	70	$2,935,200	$100	Panhandle P. & R. pfd.	.....	July 2, 23	No sales.					
57⅜	40	60¼	36¼	47⅞	35¼	(sh) 2,406,796	N.P.	Phillips Petroleum	37½eQ	Oct. 1, 28	1,457	48	50¾	47	50½	+ 2⅝
....	....	1⅛	½	5¼	½	$29,622,925	$25	Pierce Oil Corp.	.....	.....	131	3¼	3⅜	3⅛	3¼	— ⅛
7	2¼	5½	2½	6⅝	3½	(sh) 2,500,000	N.P.	Pierce Petroleum	.....	.....	660	5⅞	6½	5¾	5⅞	— ⅛
20¾	11	33⅞	16¾	28⅝	16	$37,450,850	$50	Producers & Refiners	.....	Sept. 15, 23	572	24⅞	29⅞	24⅞	29	+ 4⅜
41¾	30¾	50	36⅞	49⅝	41	2,845,350	50	Producers & Refiners pfd.	.....	May 1, 25	440	....	47¾	44¾	47	+ 3¼
31	25¼	33½	25	28½	19	75,959,350	25	Pure Oil Co.	25cQ	Dec. 1, 28	647	27⅝	28½	27	28½	+ ⅞
27½	22	28⅝	25⅜	53	23½	$29,224,894	$25	Richfield Oil	.....	Oct. 20, 27	2,382	51⅞	56	51⅜	53½	+ 2⅜
57⅜	47⅜	54½	44¼	63⅜	44⅝	(sh) 611,303	13.40	Royal Dutch, N. Y. shares	$1.879	Aug. 3, 28	139	61	62¼	60½	62	+ ¾
48⅝	40½	47⅞	41⅜	57½	40⅝	(sh) 77,590	£2	Shell Transport & T.	$1.455	July 23, 28	No sales.					
31	24	31¾	24⅝	35½	23¼	(sh) 10,000,000	N.P.	Shell Union Oil	35cQ	Sept. 30, 28	1,504	35¼	37½	34⅝	37½	+ 2½
28⅝	15⅛	26⅜	14¼	26¼	18⅛	$7,208,080	$10	Simms Petroleum	.....	Apr. 1, 27	1,314	26⅜	27¼	25	27	+ ⅞
24⅞	16¾	22⅜	15	44⅜	17⅜	(sh) 4,501,915	N.P.	Sinclair Consolidated	.....	.....	11,288	43¾	45¾	42	44½	+ 1⅜
99½	90	104½	97	110	102½	$16,604,600	$100	Sinclair Consolidated pfd.	$2Q	Aug. 15, 28	8	....	109	108½	109	.....
37⅛	26⅝	37⅜	24⅛	39	25	27,396,590	25	Skelly Oil Co.	50eQ	Sept. 15, 28	487	41¾	41¾	39⅜	41⅛	+ ⅜
63⅝	51½	60¾	50⅜	66	53	(sh) 13,016,434	N.P.	Standard Oil of California	65½eQ	Sept. 15, 28	733	67	69¼	66⅛	69	+ 2½
46⅜	37½	41⅜	35⅛	52⅞	37¾	$607,910,525	$25	Standard Oil of New Jersey	‡25cQ	Sept. 15, 28	2,182	52¾	54⅜	51⅝	54¼	+ 2⅜
47¼	30⅜	34⅛	29¾	41½	28¾	427,973,275	25	Standard Oil of New York	40eQ	Sept. 15, 28	2,328	37¾	39⅜	37½	38⅝	+ 1⅛
41⅝	30⅛	34⅞	30	65⅛	31½	(sh) 1,206,073	N.P.	Sun Oil	25cQ	Sept. 15, 28	124	61¾	74⅞	61¾	73	+11½
5¼	1	6½	3⅛	12⅜	2½	(sh) 1,121,368	N.P.	Superior Oil Corp.	.....	Dec. 20, 20	783	11⅞	12	10⅞	11	— ⅝
58	48	58	45	73½	50	$180,480,550	$25	The Texas Corporation	75cQ	Oct. 1, 28	1,554	70⅝	74¾	69⅞	74	+ 3½
19½	12	18⅞	12	26⅝	12½	8,380,340	10	Texas Pacific Coal & Oil	.....	Jan. 3, 28	495	25¼	25⅜	22	22½	— 2
39¼	27	29⅛	19	36	19⅝	(sh) 2,168,410	N.P.	Tide Water Oil Co.	20eQ	Sept. 29, 28	23	35	35	33⅜	34⅛	— ⅞
96	87¼	90⅛	85	96	86	$20,705,200	$100	Tide Water Oil Co. 5% pfd.	$1.25Q	Nov. 15, 28	37	95¼	95¼	94⅜	95¼	— ½
27	20⅞	19⅛	15¾	25	14⅜	(sh) 4,796,158	N.P.	Tide Water Associated	.....	Aug. 1, 27	837	22¾	23¼	22⅜	23⅛	+ ⅜
5½	3	10⅜	3¾	12	7¼	(sh) 3,742,029	N.P.	Transcontinental Oil	.....	.....	3,260	12¾	12⅜	11	11½	— 1
58⅜	37¼	56½	39⅝	57	42¾	$40,791,225	$25	Union Oil of California	50eQ	Nov. 10, 28	524	54⅛	56¼	54⅛	54½	+ 1
120⅜	84¼	127½	94	128⅛	116¾	30,844,000	100	Union Tank Car Co.	$1.25Q	Sept. 1, 28	15	115½	125	115½	122	+ 6½
30¼	23½	34½	24½	44⅞	26	(sh) 310,956	N.P.	Warner Quinlan	50eQ	Oct. 1, 28	1,025	42⅛	44⅜	41½	43⅛	+ 1⅜
29¾	25⅛	27½	20	32	20⅛	(sh) 490,000	N.P.	White Eagle Oil & Refining	50eQ	Oct. 20, 28	683	33⅛	35⅝	33⅛	35	+ 2¼
								Wilcox Oil & Gas			16	22⅞	22⅞	21	21⅝	— ⅞

*Odd lots. ‡Also extras.

STANDARD OIL STOCKS ON NEW YORK CURB

21	16	21⅝	17⅞	22⅜	16⅜	£4,126,460	£1	Anglo-American Oil	24.4c	June 6, 28	5,000	18⅜	19	18⅜	18½	—⅜
..	..	3¾	¾	5	1¼	(sh) 500,000	N.P.	Atlantic Lobos	.....	.....	1,100	3	3⅜	3	3	.....
76	65	69	50	56	45½	1,000,000	25	Borne Scrymser	$18.A.	Oct. 15, 28	No sales.					
59½	42	60	45	76	53	10,000,000	50	Buckeye Pipe Line	$1Q	Sept. 15, 28	1,100	67	69	67	69	+3
82½	65	126	76½	161	117¼	3,000,000	25	Chesebrough Mfg.	$1Q	Sept. 29, 28	No sales.					
25⅞	17½	22⅝	16¼	23	16	36,057,840	10	Continental Oil	.....	Dec. 15, 27	71,300	18⅞	20⅞	18⅞	20	+1
97	102	137	89	114	88	3,000,000	100	Cumberland Pipe Line	$2Q	Sept. 15, 28	100	81¾	81¾	79½	79½	—2½
63¾	43	68½	47	88	64⅛	5,000,000	100	Eureka Pipe Line	$1Q	Nov. 1, 28	50	70½	70½	70½	70½	+3½
32½	9⅞	13½	3½	12	5	16,000,000	100	Galena Signal Oil	.....	June 30, 25	100	7½	7½	7½	7½	—1¼
68⅛	52	68½	54	99	60	73,117,577	25	Humble Oil & Refining	30eQ	Oct. 1, 28	56,500	96⅜	110¼	95½	109¾	+13½
144½	125½	182	123¾	264	176½	20,000,000	100	Illinois Pipe Line	$6S.A.	June 15, 28	700	255½	259	247	259	—1
..	..	64¾	37¾	104	56¾	(sh) 6,458,267	N.P.	Imperial of Canada	25eQ	Sept. 1, 28	5,300	94½	98	93¾	94½	.....
72½	58	94½	61	91⅞	74⅞	$5,000,000	$50	Indiana Pipe Line	$1Q	Nov. 15, 28	600	83⅝	83⅝	83⅜	83⅝	+½
35½	28¾	39	28¼	55	35	(sh) 17,123,444	N.P.	International Petroleum	25c	June 30, 28	44,300	50⅜	52	48⅝	50½	+⅛
20¾	12½	24	13½	32⅜	20⅛	$6,363,350	12.50	National Transit Co.	25eQ	Sept. 15, 28	4,000	24¾	25½	24½	25⅛	+⅜
51½	27¼	44½	31¼	75	37½	5,000,000	100	New York Transit	.....	July 15, 26	100	70	70	70	70	—4¼
80½	64	100	70	125	62	4,000,000	100	Northern Pipe Line	$3S.A.	July 1, 28	600	62	64	62	63	+1¼
67¾	55¾	67⅞	52	69⅞	58	60,000,000	25	Ohio Oil Co.	50eQ	Sept. 15, 28	48,300	70	76	69⅝	76	+15¼
24¾	15	39	12	44	29	10,000,000	25	Penn Mex. Fuel	$1.25	May 31, 28	1,400	39¾	39¾	36⅝	39	+½
137½	122½	190	132	236	172	81,000,000	100	Prairie Pipe Line	$3.50	Oct. 31, 28	5,050	220	224	215	218¾	—1¼
60¼	48	55½	45⅝	56¾	46	60,000,000	25	Prairie Oil & Gas	.....	Aug. 31, 27	37,800	55¼	55⅞	53⅞	54½	—⅞
220	84½	201½	175½	212	167	4,000,000	100	Solar Refining	$5S.A.	June 20, 28	200	216	216	214¼	215	+3
74½	61½	27¼	15½	35⅞	12	5,000,000	50	Southern Pipe Line	$2	Dec. 1, 27	No sales.					
50	34½	41½	35	68⅞	36¾	2,000,000	25	South Penn Oil	50eQ	Sept. 29, 28	10,500	67¾	70¾	67¾	69	+1⅝
56	47½	83	55½	100	70	3,500,000	100	Southwest Pa. Pine Lines	$1Q	July 2, 28	No sales.					
70¾	60½	81½	64⅝	85¾	70⅞	228,415,463	25	Standard Oil of Indiana	62½Q	Sept. 15, 28	59,600	83⅞	87⅞	83⅜	87⅜	+3⅜
36½	16½	20⅞	14⅝	27¾	15	8,000,000	25	Standard Oil of Kansas	.....	June 16, 24	400	23¾	23¾	23	23	—¼
134⅜	108	130	111½	161⅜	122¼	17,012,559	25	Standard Oil of Kentucky	$1Q	Sept. 29, 28	16,300	161¼	174¼	161	174¼	—14⅜
51⅛	42	49½	40	51⅞	39⅞	4,559,850	25	Standard Oil of Nebraska	63eQ	Sept. 20, 28	1,400	49¼	50½	49¼	50½	+½
372	288	87½	72	95	71	14,000,000	25	Standard Oil of Ohio	62½eQ	Sept. 1, 28	6,800	99	111½	99	108½	+10¾
21	15	21	14½	26	16	30,734,000	25	Swan Finch Co.	.....	Nov. 1, 19	No sales.					
100⅜	90¼	..	..	93½	72¼	124,941,600	25	Vacuum Oil	75eQ	Sept. 20, 28	103,850	99	101	89½	99½	+9½

KANSAS FLOODS SHUT DOWN TWO REFINERIES

During the last week flood waters in Kansas have caused two refineries to be shut down in Kansas and considerable damage resulted to the equipment. The White Eagle Oil & Refining Co.'s plant at Augusta shut down on November 16 for several days. Communication with the plant has been made difficult and shipments have been practically at a standstill. This has not only applied to the White Eagle plant but practically all Kansas plants, especially on shipments going to the East.

The Shell Petroleum Co.'s (Roxana) plant at Arkansas City is also shut down but will resume operations by November 22. Several feet of water stood in parts of the plant yard and the shutting down of the plant was decided upon when water came over the level of the pumphouse floor. After the motors in the pumphouse are replaced and the lines drained the refinery is expected to resume operations as the level of the water has gone below the danger point.

W. W. BRUCE SECRETARY OF MARLAND OIL CO.

William W. Bruce has been appointed secretary of the Marland Oil Co. by the executive committee. Until recently he was a vice president and director of The Texas Corporation and prior to that treasurer of that company.

Technical Questions Answered

BY CHARLES K. FRANCIS, PH.D., TECHNICAL EDITOR

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

CORROSION TESTS INCLUDING ELECTROLYSIS

I have read with considerable interest the articles on pipe protection in The Oil and Gas Journal and wish to know where the mentioned literature is available? Where can I obtain Frank N. Spillers' book, "Corrosion"? Kindly outline practical field and laboratory tests that will determine fairly quickly a pipe coating's fitness for its job; particularly a test for electrolysis.—P. C. K.

The references which you ask about may be found in your local libraries and especially good collections of books and bulletins are owned by the well known university located in your city. The book by Spillers is published by the McGraw-Hill Book Co., 370 Seventh Avenue, New York. The suggestions below, in answer to your questions, are from "Corrosion."

The extent of corrosion is usually determined by one or more of the following methods: Loss of weight, depth of pitting; determination of metal dissolved or of hydrogen gas evolved; amount of corroding agent consumed, such as decrease in dissolved oxygen; change in structure as measured by tensile strength, or microscopic examination; and, in certain cases, by the electric current produced by the corrosion reaction.

Electrolysis surveys deal with the various methods and classes of measurements employed to determine the hazard to underground metallic structures due to stray electric currents, the extent of existing damage already produced, and the mitigative measures that may best be employed for reducing the danger of future trouble.

The only accurate method of determining the rate of corrosion at any point on a pipe due to electrolysis is to measure the intensity of the current to earth. If an accurate measurement of this current from the pipe at any point is made, it will be nearer to a true indication of electrolysis conditions than any other measurement. Electrolysis engineers frequently take potential difference measurements between pipes and adjoining earth as a basis for determining the current discharge from the pipe.

The Bureau of Standards has developed an instrument called the earth-current meter, which measures the average current density of discharge from the surface of the pipe over any desired small area, usually from one-half to 1 square foot. The principle upon which this instrument is based is that of placing two nonpolarizable electrodes, spaced a few inches apart, in contact with the soil on a line radial to the pipe. The electrode nearest to the pipe is, as a rule, within 3 or 4 inches of the pipe. These electrodes are connected with a suitable instrument for measuring the potential in the earth between these two points of contact. A second pair of electrodes is combined with these in such a way as to permit the measurement of resistivity of the earth in the region between the two potential electrodes. It is obvious that, if the resistivity of the earth and the potential gradient in the earth are thus measured, the intensity of the current in the immediate vicinity can be readily calculated.

CALIFORNIA BENTONITE

Will you kindly give the composition of the fullers earth which is mined in California called Bentonite? How extensive are the California deposits of this earth?—C. W. E.

There were two analyses of bentonite given in the Engineering and Mining Journal, May 22, 1926, by Melhase as follows:

	Per cent	Per cent
Silica	50.30	50.56
Alumina	15.96	15.62
Ferric oxide	0.86	0.24
Lime	1.24	1.48
Magnesia	6.53	4.56
Alkalies	1.64	7.72
Moisture	23.61	19.12

Several deposits of bentonite are known in California but probably one of the most extensive is the Otay deposit in San Diego County, owned by the General Petroleum Co.

This deposit occurs at about 400 feet above sea level and extends over an area of several thousand acres. The thickness of the bentonite bed ranges from 4 to 6 feet, but the material is not of the same quality throughout. The color varies considerably, there being nearly pure white, pink, green and chocolate-colored bentonites.

The lower stratum, about 6 inches thick in the Otay deposit, is almost a pure white, resembling Castile soap in texture and feel. This stratum appears to persist over the whole area of the deposit.

The bentonite of this deposit is being actively mined. For the most part the material lies under a light overburden, and can be quarried, but where the overburden is heavier it is preferable to mine by underground methods. When first mined the bentonite contains about 30 per cent of moisture and is somewhat sticky, but sun-drying will reduce the moisture to about 7 per cent.

HEAT EXCHANGER CALCULATIONS

Would it be within the policy of your Journal to give me some data on the calculations for heat exchange units? I am desirous of knowing the method used in calculating the size of tubes, number of passes and the necessary velocity of the cooling medium when given the temperatures of the hot and cold medium, quantity, velocity, etc.—N. S.

An adequate discussion of all the facts and data required for the solution of heat exchanger problems requires more space than is available here.

I suggest that you refer to Principles of Chemical Engineering, by Walker, Lewis and McAdams, published by McGraw-Hill Book Co., 370 Seventh Avenue, New York. Chapter 4, page 118, discusses the subject, Flow of Heat. You will find on page 142 under Illustration 5 the analysis of a problem dealing with an oil to oil heat interchanger.

ASPHALT AND ROAD OILS

Please publish most efficient method for refining asphalt and road oils.—C. B. W.

Road oils are usually obtained by distilling crude oils of the asphaltic or mixed based type until the lighter products have been removed and a residue is obtained which will meet the required specifications. The distillation is in most refineries conducted in the presence of steam. There are numerous road oils and the specification of the Illinois State Highway Department for a medium asphaltic oil will serve as an illustration.

"This road oil shall be homogeneous and shall not contain more than 1 per cent of water measured by volume. It shall meet the following requirements:

Specific gravity at 60 degrees Fahrenheit, 0.950 to 0.980 (approximately A. P.I. 17.5-12.9).

Specific viscosity at 140 degrees Fahrenheit, 16 to 28.

Total bitumen (carbon disulphide soluble), not under 99.5 per cent.

Bitumen soluble in 86 degrees naphtha, not under 12 per cent.

Flashpoint, not under 176 degrees Fahrenheit.

"When 50 grams of the oil are evaporated at 250-260 degrees Centigrade until the residue has a penetration at 25 degrees Centigrade, (100 grams in five seconds) or 90 to 110, the residue shall have a ductility at 25 degrees Centigrade of not less than 50 cm."

Asphalt is made from the asphaltic oils by the distillation process, both batch and continuous; the lighter parts of the crude oil being removed in the form of distillates, and the heating of the oil is continued until the residue reaches the desired consistency. There are three processes used for the final reduction of the residue and the kind of asphalt obtained may be classified so as to indicate the process; as, steam refined, air refined, and the combination air and steam refined. It is important when making a road oil that the reduction shall not go far enough to cause a decomposition of the heavier hydrocarbons and the result in the formation of free carbon and coke. The same is true when asphalt is the desired product. When making asphalt by the air method, the fire is removed at a safe temperature and the process continued by blowing with air.

This is of course a very brief outline of these processes. You will find details in any of the standard reference books on petroleum refining.

VACUUM PROCESS FOR LUBRICATING OILS

Give an outline of the process for refining lubricating oils using the vacuum distillation?—C. B. W.

The separation of the lubricating stock from a crude oil by means of vacuum distillation rests upon the same principle as employed in ordinary distillation. That is, by heat. The essential difference being that the oil boils at a lower temperature because of the removal of the atmospheric pressure. The products separated are lighter in color and free from these compounds which are normally formed at the higher temperatures because of the complicated changes commonly indicated by the word cracking. There must be some modification of the distilling unit to compensate for the greatly reduced pressure so that there will be a safe condition for operation and no damage to the parts.

The pressure is reduced by means of suitable pumps to approximately five millimeters of mercury and the oil kept in the heating zone for the shortest possible time. Oil may be reduced by the batch system under vacuum conditions but the modern installations are for continuous distillation. An important condition for good results by vacuum distillation is that there should be a thin body of the oil under maximum turbulence. Steam is introduced in some of the existing processes and there may be some mechanical means for stirring the oil as it passes through the unit.

The advantages of the vacuum process for distilling oils have long been recognized but the problem involved in safe construction was serious when the process was confined to the shell still. With the perfection of the pipe still within very recent years, this problem seems to have been solved and as a consequence the interest in the process has been revived. The pipe still has added advantages; including economy of heat transfer, rapid removal of the vapors, low operating expense, safety and flexibility.

The influence of reduced pressure has been determined for a hydrocarbon boiling at 577 degrees Fahrenheit under 760 mm. normal atmospheric pressure. This was lowered to 320 degrees Fahrenheit under a vacuum of 10 mm. and to 176 degrees Fahrenheit under the highest vacuum obtainable.

A vacuum process is described in some detail in The Oil and Gas Journal, February 26, 1925, page 115.

ODOR OF GAS OIL AND FUEL OIL

Is there any simple method by which the odor of a gas oil or fuel oil could be removed, for instance like filtering through fullers earth or something of that kind?—E. S.

The odor of a petroleum oil depends on the source, or composition, of the crude oil and the extent to which it has been refined. The terms that have been used to indicate the odor of petroleum products include aromatic, acid, pungent, cracked, sweet, fatty, tarry, sour, sulphur, hydrogen sulphide, creositic, pyridine, ethereal, organic. Some of these are indefinite and do not mean the same thing to any two persons. However, most of them may be classified by one who is familiar with the numerous oils and the methods for refining.

The sweet and ethereal products are commonly obtained from natural gas and the oils in which the paraffin hydrocarbons predominate without the contamination of sulphur compounds. The aromatic odor is prominent in some crude oils and may be noticed in the product obtained when the oil has been subjected to high temperatures. The odor of pyridine and creosote may be detected in the oils from shale; pyridine is especially prominent in the products obtained from the high-nitrogen oils.

Very few of these odors are objectionable under the conditions where the oil is consumed. Of course hydrogen sulphide is both unpleasant and corrosive, but there are very few gas oils and fuel oils which contain appreciable quantities of this substance, because it is removed in the process of separating other petroleum products from the crude oil.

If the refining process is complete all color and odor may be removed from even the heavy oils as illustrated in the case of the medicinal oils. There is no demand for this extensive treatment and the consequent high price when an oil is to be used for fuel.

Filtering through fullers earth and charcoal will often improve the odor. Caustic soda treatment may be necessary for certain compounds. Washing with warm water will be enough under some circumstances. Very seldom is any kind of treatment necessary simply to change the odor. A less expensive method is the addition of something like merbane oil to give what some consider a pleasant odor

IMPORTANT FACTORS IN PUMPING WELLS

(Continued from Page 88-B)

and physical angle, and to properly check the conclusions drawn there it is essential that accurate field records of their surface be kept augmented by information that may be obtained from dynamometer, indicator card, and wattmeter readings. Data obtained from the dynamometer not only enables one to know whether or not his rods are being overloaded, but serves as an analyzer of the correctness of the operation of the rest of his pumping equipment. Many strings of rods are condemned for failing that the dynamometer, if used, would have pointed to some other part of the equipment as being the trouble maker, such as faulty counterbalancing, plunger sticking, too high or low a pumping speed, wrong length of stroke, or a poor combination of both speed and length of stroke, loose jack posts or Sampson posts, loose pitman bearing, polish rod pulling too far out of pump, engine governor not properly set, or any one of many common causes of trouble in the pumping equipment. It is interesting to note that many of the wells that have been weighed in Seminole show that the rods were heavily overloaded.

Better Instruction

The more records of this type that we keep the more rapid will be our improvement on all parts of our pumping equipment and the lower result and cost for each barrel of oil lifted. Better care of the equipment in use by the proper instruction of the well crews in such matters will pay large dividends. One company has decreased their down time to a remarkable degree by merely instructing their well crews to reject all rods that are kinked and not attempt to straighten them by pounding with a rod wrench or hammer. Hanging rods instead of laying them down on a rod walk tends to minimize the kinking danger. Care to see that no tools are used on the rods that would cause a cut in the surface skin will prevent many a rod failure. Some companies are saving themselves considerable potential rod trouble by making a careful inspection of the new rods before running them, and all rods that show any signs of surface cracks or having scales rolled into the rod body, are rejected. In making up the new A.P.I. rod, considerable care is used in seeing that they are properly set up and shouldered. Where a study of records reveals a preponderance in the upper 1,500 to 2,000 feet of the string, taper strings have been used to a very good effect. The three-quarters-inch A.-P.I rod is in general use in Seminole.

Working Barrels and Valves

By L. B. Holland

A discussion of working barrels and valves alone could well occupy the attention of this meeting for a much longer period than is allotted to this subject in this paper.

Although various types of special barrels are used in the Mid-Continent district, under special conditions, by far the largest percentage is what is ordinarily called the "common" barrel which consists of a tube in which operates a cup type pump. For this reason this discussion will be largely confined to a brief outline of some of the difficulties which have been experienced with the common barrel and some suggested remedies for these troubles.

It is true, however, that the plunger type pump, which is used to such a great extent in California, has also been used in the Mid-Continent district, but it has been found that when used to pump any except the heaviest oils it becomes necessary to equip the plungers with cups in order to allow sufficient clearance between the plunger and the barrel to insure successful operation. The difficulty seems to be that when used in high gravity oil, the fluid seal between the plunger and the barrel is not sufficient to prevent slippage.

A large amount of thought has been expended in the improvement in traveling valves. Some operators and manufacturers previously contended that there should be sufficient clearance between the valve body and the followers to permit the valve to be readily dismantled for replacement of cups even though sand should have worked into the clearance space. Some of the operators of one of the Mid-Continent companies developed the idea that such excessive clearances as had been used between the followers and valve bodies would tend to cause lost motion to develop, allowing the followers and cups to tip one way on the upstroke and the opposite direction on the downstroke, causing early leakage past the cups which in turn would increase pulling costs due to the greater number of pulling jobs. After this condition was remedied, and the valve bodies and followers so fitted that there was a slip fit, the number of pulling jobs was materially decreased.

Tube Requirements

The requirements on working barrels is that the tube be of uniform internal diameter, smooth interior surface, straight and of hard material of sufficient tensile strength that the tube will not distort under the pressure met in working barrels and that the threads will be sufficiently strong that failure will not occur at this point. In as much as the tensile strength and hardness increase with the carbon content of steel and properties of steel which cause it to draw smoothly decrease with an increase of carbon content, it is readily seen that the grade of steel used for this purpose is merely a compromise.

Another difficulty attendant to checking of the accuracy of the internal bore of working barrels is the fact that at the present time there is not an instrument available by means of which the internal diameter of 2-inch or 2½-inch barrels can be checked throughout their whole length.

The very crude method of "feeling" of the inside of the working barrel with a working valve cup or a "go" gauge has caused as many as 23 out of a shipment of 25 working barrels to be rejected by one producing company in the Mid-Continent area. Splitting the barrels lengthwise has also revealed that barrels which appear smooth when looked through may be very rough. It is estimated by different companies that from 25 to 50 per cent of cup trouble is chargeable to rough working barrels.

If this be the condition, the solution of the problem is the development of a straight working barrel which has a smooth interior surface, is of uniform internal diameter, and at the same time is as hard as possible so that it will resist abrasion in operation. It is doubtful whether a steel tube using carbon alone for the hardening agent can be made of sufficiently smooth interior surface that it will resist wear. It is believed that experimental work on alloy steels for working barrels is justified by the demand for better working barrels.

Removable Liners

Another means for solving this problem is by removable liners or by interior coatings applied to barrels made of soft steel which had been made smooth previous to the application of the coating. Cast iron liners in steel barrels are being tried with more or less success. There are two difficulties with cast iron liners in steel barrels. One of these is the almost impossible task of grinding a tube longer than 12 inches. The other is that the coefficient of expansion of steel is slightly higher than that for cast iron. This causes the sectional liners to tend to become loose in the steel shell in the well or when exposed to the sun, due to the materials of which the barrel is constructed, reaching a higher temperature than the one at which the cast iron sections were assembled in the barrel.

The possibility of lining the barrel which has previously been made smooth with a hard coating is another line along which work might be done. Glass liners for working barrels have been tried without much success. Several of the large enameling companies have advised that the coating of the inside of the tubes with enamel would not be practical.

Some work has also been done in the electroplating of the interior of working barrels with a metal which is sufficiently hard to resist abrasion. It is believed that this is the ultimate solution of the problem of obtaining working barrels which have the required properties of being straight, and of uniform internal diameter, and with a smooth interior surface sufficiently hard to resist abrasion.

Volumetric Efficiency of Pumping Wells

By D. L. Trax

The efficient operation of an oil well pump is possible only by taking into account the type of well in which it is to be used, then selecting a pump that will meet the requirements involved, and operating it with both peculiarities of the well and the specifications of the pump in mind.

The pumping operation consists simply of lifting the fluid one stroke at a time until it reaches the surface. It would seem that the faster the pump is operated and the longer the stroke of the pump, the greater would be the production, but there is a place between the low speed and the high speed and the long stroke and short stroke where the lines of efficiency meet and an increase or a decrease of speed or stroke will decrease instead of increase the production.

With an investment of $10,000 to $70,000 per well it is important that efficient equipment be used in order to obtain the greatest returns on the investment. If the fluid production of a well is accurately gauged at regular intervals, the volumetric efficiency of the pump may be determined by dividing the number of barrels actually pumped by the volumetric displacement of the pump. The volumetric displacement is the exact area of piston or plunger in square inches times length of stroke in inches, times number of strokes per minute, times minutes operates and this amount in cubic inches reduced to barrels. In the determination of volumetric efficiency of a pump in this manner, the hydraulic efficiency of the pump is of course included and in some cases a low volumetric efficiency may be due to a low hydraulic efficiency.

It has been found that volumetric efficiencies range from 11 per cent to over 100 per cent. In the case of the low efficiency, on investigation it was found that the valves were leaking while in the case of efficiencies over 100 per cent, gas in combination with the oil was assisting the pump. Hence, a low volumetric efficiency of a pump may indicate leaky balls and seats, worn cups or plunger or the wrong method of operation.

Speed of Pumping

The speed of pumping is a prime factor. At a very low speed the inertia of the fluid increases the power required. At too great a speed, the friction of the pump may cause the sucker rods to kink or whip with the result that the traveling valve only partly completes its stroke and the fatigue action on the rods becomes excessive.

The speed of operation is affected to a great extent by the length of stroke. If one long stroke will lift the fluid as far as two short strokes in the same time, real economy is effected through the longer stroke. This economy is not only a reduction in wear and tear on equipment, but will increase volumetric efficiency of the pump by reducing the vibration of the sucker rods and overcoming to some extent the loss of stroke caused by the spring or stretch in the rods. It has been determined that when operating a pump in a shallow well, the length of the stroke on the pump is practically the same as the length of stroke at the surface. In deep wells, however, this spring may be considerable and can only be estimated on account of varying gas pressures and other conditions. The tubing is also somewhat elastic and has a tendency to move up and down as the fluid weight shifts from the sucker rods to the tubing. This movement is indicated by the vertical wear on the tubing couplings.

In determining the proper rate of pumping, it is well to remember that the space between the valves must be entirely filled with fluid on each upstroke of the pump. Where this is not the case, the traveling valve pounds on the downstroke, forming gas pockets with a loss in efficiency. Too rapid pumping may reduce the fluid level allowing the admission of gas or air in the working barrel and also decrease the efficiency.

Submergence of Pump

There is no set rule, regarding the submergence of an oil pump, but it is usually desirable to secure the maximum head of fluid on the standing valve. Unless submerged to sufficient depth in fluid the pump depends upon the suction effect of the upstroke of the traveling valve to draw in a supply of fluid. This is usually inadequate to fill the working barrel with a full fluid column because of the restrictions imposed by the ordinary standing valve. The resistance to flow offered by this valve increases proportionately as the speed of the traveling valve increases, hence the greater the speed of the traveling valve, the greater should be the submergence in overcoming resistance offered by the valve, hence insufficient submergence with the friction losses through the standing valve and openings to the valve tend to lower the hydraulic efficiency which in turn decreases the volumetric efficiency.

Every pumping well should be studied and every effort made to maintain maximum production by efficient methods of operation. How long a stroke to use and how best to provide that stroke is a matter for production operators to determine with their respective equipment but a careful consideration of this subject indicates the methods toward which to work.

Combination Flowing and Pumping Wells

By Morgan Walker

Combination flowing and pumping makes it possible to produce more fluid from deep wells making large volumes of oil and water and on which the rock pressure is low, than can be pumped with the ordinary pumping equipment. The equipment usually consists of a hook-wall packer run on the tubing and set in the casing above the sand. If there is a liner in the hole, the packer is usually set in the liner. Perforations are cut in the tubing above the packer. Rods are run just as they are in the ordinary pumping installations together with the same style of working barrel and traveling valve.

The oil and water are pumped in the regular manner up to the point where the perforations are cut in the tubing, and gas is introduced into the fluid column either from the tubing or from the annular space between the tubing and the casing. The advantage of flowing up between the tubing and the casing is that a smaller string of tubing can be run for a given amount of oil and water to be handled. The disadvantage is that the rods have to be lubricated from the surface. This is done by forcing oil into the gas line near the well.

If the fluid is to be delivered through the tubing, a string of 4-inch tubing is usually run with a string of three-quarters-inch rods. With this equipment 700 bbls. of oil and water can be handled per day with a gas volume of 1,000,000 feet per day and a working pressure of 300 pounds per square inch from wells 4,000 feet in depth. If the oil and water are to be handled through the annular space between the tubing and the casing, 3-inch tubing is usually run for the same set of conditions as given above. With the latter installation the working pressure will usually be 250 pounds per square inch and the volume of gas required about 1,150,000 feet per day. The formational gas-oil ratio is about the same as that obtained by swabbing.

The cost of combination flowing and pumping is usually less than that for swabbing due to less damage to equipment and about the same amount of fluid can be handled. Due to the added compressor costs, this method costs more

than straight pumping but rod breakage is reduced and more water and oil can be handled.

This method of production is used largely for determining the potential capacity of wells after the water production has increased until the water can no longer be kept down by straight pumping, and if it is found that the oil production is large enough to warrant its use, it may be continued.

Pumping Records

By J. R. McWilliams

Pumping records tabulating the reason for the down time on a well are as useful to the superintendent and executive in charge of production as cost records are to the management of a company. It is just as important to know why a well is not pumping regularly as it is to know how much it costs to pump the well. Lifting costs tell whether it pays to pump a certain well; and pumping records tell whether the well is down so much that it cannot produce the amount of oil it is capable of producing.

The information in Table 1 illustrates the reduction in down time per well per day that one of the Mid-Continent companies experienced after installing a simple system to indicate to those in charge of production the reason a well was not pumping and the length of time that elapsed before pumping was resumed.

It will be noted in Table 1 that in the Duncan district, the average weighted down time per well per day was reduced from 1.401 to 0.330 hour per well per day over a period of two years. With the exception of one or two districts the superintendents in charge were able to show a substantial reduction in the amount of time their wells were not pumping. It is believed that the information furnished by the down time system was largely instrumental in securing this reduction in down time by assisting the superintendent to know what particular wells were causing the down time, and what the reasons were that the wells were not pumping. In most districts a superintendent cannot visit all of the properties under his charge in one day so it is desirable for him to know what particular properties need his attention.

A record which states the reason why a well stops pumping is of considerable value in detecting whether a piece of equipment is suitable for the particular well in question. Perhaps a worn out engine is used in a power to pump 10 or 12 wells. The pumper tries to keep the engine running but he has a difficult job. The superintendent knows that the engine is in bad shape but it takes data tabulated over a period of time showing that the major part of the down time on 10 or 12 wells is caused by a worn out engine to prove that it is economical to junk the old engine and buy a new one.

A record tabulating the reason why wells stop pumping puts definite information in the hands of those responsible for the operation of the wells, and in addition allows anyone interested in operations to have the same information as those actually on the ground.

ROCKY MOUNTAIN ENGINEERING PRACTICE

(Continued from Page 42)

sand that would be lost to the producer.

The gas pressure placed on an oil sand by gas injection will change the surface tension of the oil and also its viscosity, for it has been found that crude oil will absorb gas in proportion to the pressure. On the other hand, the same gas, on being released under pressure in the sands, has a strong tendency to chill, due to the expansion and this tendency to chill will cool the crude in the immediate vicinity, causing its viscosity to increase and its flowage to the well to decrease so that the sand retains the oil in its pores.

Here Professor Germann illustrated the action of liquids under capillarity by small bore glass tubes containing droplets of liquid. Where these droplets of liquid were held in a tube it was almost impossible to exert pressure enough to discharge them at the end of the tube. Even by blowing into one end of the tube with all the pressure a man could bring to bear there was no discharge at the other end although had the capillary tube been filled completely with fluid, a moderate pressure would have emptied the tube. With spaces between the droplets of liquid, the capillary attraction seems to cushion a pressure exerted on one end of the tube and prevent its being felt against the farther droplets with sufficent force to drive them out.

The same effect is found in oil sands. Here the situation is a series of small tubes connecting larger holes and every tube being in fact a capillary tube with minute droplets separated by gaseous space, a pressure therefore on one well is unable to relieve this condition except in a small way, and the result is the leaving of large quantities of petroleum in the sand through this capillary action.

Papers on Gas Drive

John W. Steele, supervisor of the United States Geological Survey, was to follow on the program but due to a bad fall from a horse while elk hunting in the Jackson Hole country, he was absent. His place was taken by H. V. Matthews, gas engineer for the United States Geological Survey at Salt Creek, who had prepared a paper on the gas drive as practiced in Salt Creek Field. As Mr. Matthews' paper and that of L. C. Binning, gas engineer for the Prairie Oil & Gas Co. on the Lost Soldier gas lift were very much alike in their general conclusions, a resume of both is given.

In the Lost Soldier and Salt Creek Field the gas drives and gas lifts are used to increase production primarily; the utilization of the natural gas is a secondary consideration and the repressuring of the sands comes as a result of the pumping of the gas back into the wells. In Lost Soldier Field the gas lift is found to cost about 24 cents per barrel with a production of 33,000 bbls. but in warm weather this figure changes; in June it dropped to 16 cents per barrel. One of the main factors developed by these two papers was that the tapered tubing made practically no difference in the production of the wells.

In the Lost Soldier Field, the first well tried out was a Sundance sand well that had a natural flow of 350 bbls. daily. The gas lift seemed merely to steady the production of this well and did not increase it any. The second well tried increased its production at once to a 500-bbl. production and the third well made an increase of 100 bbls.

The initial trial of gas lift on the three wells was made with a Cooper unit of 160 horsepower and the pressure used was 80 pounds. The Prairie Oil & Gas Co. now has six of these units in operation in the Lost Soldier Field and has a working pressure of 125 pounds while a 1-pound vacuum is kept on the wells. The gasoline production amounts to 1,600 gallons daily and the exhaust gas is cycled through the sands. In the operation of the system, four control stations are located over the field.

The christmas trees are so arranged that the input and output can be reversed at will and the gas and oil are separated in regular oil field separators with the working parts removed. The tubing is generally 3-inch although some 2½ and 2-inch is used. The gas enters the wells hot and this heated condition is obtained through special steam heaters. This condition keeps down the paraffin content, the kickover pressure is 250 pounds.

Not Complete Success

The gas lift is not a complete success in Lost Soldier, according to Mr. Binning. Several wells have been changed back to pumping after being tried out with the gas lift and in these cases, a decided increase in the production was noticeable. One of the greatest troubles in the Lost Soldier Field is the collection of paraffin between the tubing and casing in the wells.

In the discussion that followed, Mr. Millikan of the Amerada Petroleum Corp. in particular brought out several interesting points in comparing his company's operations in the Mid-Continent fields with the two Wyoming fields as described in the two papers.

In the Seminole Field there is no trouble from paraffin and the heating of the gas is not general, but in several other fields there is paraffin trouble and it is treated largely by chemicals. The operators in the Mid-Continent fields are now generally agreed that the intermittent application of gas pressure to the wells gives best results although there is still some uncertainty whether the annular flow or the straight tubing flow produces the best results. Tapered tubing has been found to make no difference and is no longer considered a factor.

Association Meeting

The afternoon session was held under the auspices of the Rocky Mountain Oil & Gas Association. A paper on "Future Oil Roads in the Rocky Mountain Region" was read by C. H. Bowman, highway engineer for Z. E. Sevison, highway commissioner of Wyoming, who was unable to attend.

Gov. Frank C. Emerson of Wyoming endorsed the program for oiled roads in no uncertain terms, citing particularly the small investment required to build this type of highway compared with the great benefit from their use, although Wyoming had only started building roads with asphalt oils. Governor Emerson closed his talk with a plea for a continuation of the present policy of fair dealing between the oil men and the State. He extended a cordial invitation to the oil operators and companies to present their problems of legislation or State leasing at any time and promised his co-operation.

B. E. Sibley read a technical paper on "Automotive Fuels and Lubricants," and Attorney Hal W. Stewart of the Ohio Oil Co. closed the talks with a paper on "State and Federal Legislation With Relation to the Oil Industry."

The directors were elected for the coming year for the Rocky Mountain Oil & Gas Association: Governor B. B. Brooks; John McFadyen, Ohio Oil Co.; W. D. Weathers, Fargo Oil Co.; M. J. Foley, Continental Oil Co.; R. B. Leggett, The Texas Company; Ralph Loucks, Carter Oil Co.; R. S. Ellison, Midwest Refining Co.; Charles Sherman, Union Oil Co.; R. D. Wallace, Prairie Oil & Gas Co.; C. B. Richardson, Consolidated Royalty Oil Co.; E. B. Coolidge, Hardrock Oil Co.; John Howard, Utah Oil & Refining Co.; M. T. Rathvon, Argo Oil Co.; W. B. Look, Empire State Oil Co.; A. Baker, Ohio Oil Co., and L. D. Aiken, Midwest Refining Co.

Resolutions Adopted

The resolutions committee reported the following resolutions which were adopted:

"That the convention go on record as opposed to any increase in the gasoline tax and especially that no monies derived from such tax be diverted to other uses than the building of roads and highways.

"That the Rocky Mountain Oil & Gas Association go on record as in favor of unit operation of all fields in the Rocky Mountain region.

"That the Rocky Mountain Oil & Gas Association go on record as opposed to the passing of any further legislation regulating the oil industry.

"That the Rocky Mountain Oil & Gas Association approve the use of black or asphaltic oil for use on highways and roads and that Wyoming oil should be used in preference to products from other states."

JIM LEGOULLON WAS GOOD FRIEND TO MANY

(Continued from Page 42)

He stopped, as was his custom, investigated their predicament and then proceeded promptly to get them out of it. A larger car had struck the one driven by the two women, a mother and daughter, and disabled it. The offending driver had not even stopped to inspect the damage. Passing motorists had shed a glance of momentary interest, and gone on. There was nothing about the appearance of the two victims of misfortune to indicate that they were of high social standing in Tulsa, their home, and that the older woman was a leader in musical circles. They had started out for a little ride and did not have a cent of money with them.

Help at Last

Jim got the disabled car off the road entirely to wait for a wrecker to take it back to Tulsa, put the women in his own car and drove them to their home. Then he drove out to Skiatook again. It was only a routine incident to Jim, who was sheepishly embarrassed when he discovered that one of the Sinclair executives had been told about it. The women had spoken glowingly of his "remarkable courtesy and kindness" and referred to him as an "angel in disguise." That characterization compassed the climax of Jim's chagrin.

There would be huge satisfaction in being able to say that all Jim LeGoullon's kindnesses and unhesitating sacrifices were repaid with the appreciation and gratitude they merited, but the unpleasant fact is he sometimes had to deal with thanklessness. One costly form of ingratitude—costly for Jim—was that manifested by some of those persons for whom, notwithstanding the well-known hazards of the practice, Jim endorsed notes. Friends have seen him pay without a whimper one of these notes that had gone to protest. The unchanging quality of Jim's sympathy for anybody in trouble and his persistent confidence in the fundamental honesty of mankind were indicated by the readiness with which he would endorse the next note. Unbusinesslike? Foolish? Of course. But—

One species of ingratitude which merely drew a chuckle from Jim was that exhibited by some workman whose pay envelope had been given to his wife instead of to himself. This happened when Jim found out that the man was drinking and was likely to squander his money. Picturesque epithets of the oil field applied to the superintendent in such circumstances were ignored. He knew the man would be remorseful later.

Jim was human. He formed deep likes and dislikes. The dislikes as a rule were grounded in some reprehensible action on the part of the man who incurred them. But there was no taint of vindictiveness in Jim and more than once he was known to take the part of a man who had earned his aversion, who perhaps had done Jim a plain wrong.

Just "Sorry for the Poor Devil"

If some kindness on Jim's part chanced to be the subject of comment he was likely to say, "Oh, well, I was sorry for the poor devil," and to discourage any further talk about it.

Every Christmas season Jim collected great quantities of mistletoe in rural districts to which his work took him and this he distributed among other Sinclair men when he returned to the company offices in Tulsa. Jim could no more help doing things like that than he could keep the buds from opening on the roses and poppies that he loved. It was literally true that Jim LeGoullon found his greatest happiness in making others happy, in lightening their burdens, in bringing sunshine into the dark places of human lives.

Mr. LeGoullon was born in Franklin, Pa., in 1885. In young manhood he entered the service of the National Transit Co., working as a gauger, engineer and construction foreman. He went to Oklahoma in 1918 and was employed by the Sinclair Pipe Line Co. first as a pump repair man and then as a gauger. In 1920 he was made district foreman in the Big Heart (now Barnsdall) district of the company and later in the Skiatook district. While in Skiatook he served as mayor. After three years as district foreman he was promoted to division superintendent, overseeing the Skiatook, Nowata and Barnsdall districts.

Several years ago Jim developed an organic malady that required a surgical operation. His heart was in such a weakened condition that the doctors did not dare to give him a general anesthetic. Local anesthesia only was used and Jim talked with the surgeons while they performed the operation as he watched them. The heart affection ultimately caused his

death after a short illness. He was a member of the United Presbyterian Church and was a thirty-second degree Mason, being a member of the Consistory in Guthrie, Okla. Besides his wife he leaves four daughters.

An obituary of Mr. LeGoullon read at the funeral closed with these words. "Goodby, Jim. Whatever of good and peace and happiness may be in store for the deserving on earth, yours will be an abundant portion."

CONSERVATION IN HANDS OF LAW COMMITTEE

(Continued from Page 40)

these wasting resources in the public interest, and also of the national security, has reached the conclusion that specific legislation covering the two subjects should be prepared by the committee.

Now, Therefore, Be It Resolved, as follows:

That the chairman of this committee be authorized and directed to appoint a subcommittee of four from the membership of this committee to prepare suggestive legislation covering the two subjects hereinbefore mentioned, such legislation to be in such form as fully to protect the public interest and at the same time permit the petroleum industry as much freedom of action in the production of oil and gas as the peculiar nature of the business demands, and as shall be consistent with the major purpose of conserving the oil and gas resources of this country.

That in connection with the framing of such legislation the subcommittee shall prepare a comprehensive brief in support thereof, covering both the practical and legal questions which may be involved. All this material to be in the hands of the chairman of the committee not later than December 15, 1928; the chairman immediately thereupon to provide each member of the committee with a copy of the suggested legislation and of the brief in support thereof.

That as soon as may be after December 15, 1928, and not later than December 25, 1928, each member of the committee shall notify the chairman in writing of his approval or disapproval of the proposed legislation, or in what particular the same should be modified or changed. That if a majority of the committee shall agree upon the form of the legislation, then by notice to that effect to the chairman, the same shall constitute the action of the committee with the same force as though the committee were in formal session.

That the purpose of placing a time limit on the work hereby authorized is to have the proposed legislation ready for submission to the Legislatures of the various oil-producing states which assemble in January, 1929.

OTHERS ADOPT PLAN OF STANDARD OF NEW JERSEY

(Continued from Page 130)

business in definite territories naturally took every means within their power to hold their markets, and this inevitably took the form of "meeting competition." Normally, a price change on either tank wagon or service station gasoline is a matter for action by the executives of the sales departments of the large refining companies, and is made only after mature deliberation and revisions in the refinery situation which justify a price move in either direction. During the years 1925, 1926 and 1927, it was no uncommon practice for the refiners to authorize their branch managers in the towns and cities in which they were marketing to change their selling prices whenever necessary to "meet competition." The natural result of a situation such as this was badly disorganized markets, to say the least.

Former Market Methods

During the period of sharpest competition among refiners and marketers, a new class of "middleman" came into the field. A number of "oil jobbers," actually nothing more than speculators, entered the picture. These "distributors," so-called, found it quite profitable to play one seller against another, and succeeded in buying gasoline considerably below market quotations. Distressed cargoes of California gasoline were often marketed in this fashion. The "jobber" in the deal often turned the gasoline over without ever handling it. The era of overproduction and overstressing of sales effort also created a new class of legitimate distributors, who have since become firmly intrenched within the industry, and now handle considerable gallonage within the territory.

Depleted earnings on gasoline production and sales naturally resulted from the chaos which prevailed throughout the East Coast territory, and refiners soon found that aside from a small refining profit, there was little in gasoline, beyond that sold at their own company stations.

The logical solution of the problem created by this excessive competition was the development of company-owned service stations. Several of the large companies in this area, including Standard of New Jersey, Standard of New York, Tide Water Associated, Gulf Refining, Cities Service, and others have acquired substantial chains. Development of this expansion program, however, was retarded by the unfavorable conditions in other divisions of the refiners' business. The large integrated companies were beset with difficulties in their crude oil departments, and it was obvious that a program of strict conservation of cash assets was necessary. This, of course, was an effective bar to more extensive development of the filling station end of the business.

Early this year, refiners appeared to arrive at a realization of the fact that regardless of any new sales schemes they might devise, there was always a competitor to "go them one better." Thus, with a stalemate arrived at, sentiment turned in the other direction. Drastic action toward curbing of many of the uneconomic marketing practices was decided upon by individual companies.

Refuse Concessions

First evidences of a change in sentiment on the part of refiners and marketers was given at the close of the first quarter of the year, when it became known that a number of the leading interests in this territory had refused to renew contracts with filling station owners calling for price rebates, pump rentals, and advertising allowances. Previously, the extent of these rebates and other allowances had been so great that in an 18-cent tank wagon gasoline market, filling station owners were often getting their supplies of motor fuel as low as 12 cents a gallon. With an 18-cent tank wagon schedule, the retail price would normally be 21 cents. If this had been maintained, the filling station owner would have been grossing 9 cents a gallon on his sales of gasoline bought at the 12-cent basis. With the filling station owner, however, it was a case of "easy come, easy go." Thus, the industry in the East Coast territory was treated to the spectacle of established brands of gasoline posted at a schedule which justified a 21-cent retail price, selling retail at filling station for 15, 16, or 17 cents a gallon, 1 to 3 cents per gallon under the quoted wholesale price. That the "official tank wagon price" fell into disrepute is little cause for wonder.

BIG DRILLING CAMPAIGN ON AT MISSION POOL

(Continued from Page 37)

Wilcox sand 4,464-66 feet, and began flowing 2,600 bbls. daily on November 9, 1927. It was shut in completely, and by the co-operation of the owners of nearby acreage, another drilling campaign was temporarily averted.

The Gypsy's Mission well was drilled into the Wilcox sand June 6, 1928, and flowed 3,200 bbls. daily from sand found 4,327-40 feet. The Twin State Oil Co. discovered a Wilcox sand well good for 1,300 bbls. initially in the NW cor. NE NE, Section 8-8-6. At about the same time, the Gypsy's Barkus well in the SE cor. SW, Section 6-8-6, was discovered, and the spread of Wilcox sand production uncovered between these wells is what initiated the present drilling campaign.

While any estimates regarding the future of the new pool are almost 100 per cent guesswork at this time, considering the average thickness of sand discovered, and the distance between the wells, it is likely that a pool having a peak from 80,000 to 100,000 bbls. daily may be discovered in the Mission area.

There are those in the geological branch of the industry who are not favorably inclined to the north part of the structure, and who believe that wells in this part of the field will prove to be very erratic.

Since the wells which have been completed into the Wilcox sand have had a very limited opportunity to show how they will act when permitted to have an open flow for some time, very little is known regarding the longevity of the pool in the matter of sustained production, but the majority of estimates place the peak of the pool between 80,000 and 100,000 bbls.

GETTING OIL FROM COAL NOW GAINING GROUND

(Continued from Page 38)

ganization of the coal industry along rational lines. It is predicted that raw coal will decrease in importance, while the importance of low temperature distillation products will increase. It is suggested that treatment of millions of tons of coal and oil shales yearly, involving development of an industry of unprecedented magnitude, must be undertaken promptly in order for Great Britain to be in a position to face an inevitable oil shortage.

FRIDAY

Low Temperature Distillation Section

"Manufacturing Bituminous Coal From Petroleum," Dr. Walter F. Rittman, professor of commercial engineering, Carnegie Institute of Technology. The author describes a process of manufacturing coal from petroleum, and suggests that coal thus obtained may prove to be an ideal starting material for the process of manufacturing petroleum from coal. A combination of processes is outlined by which the desire of technologists to convert crude oil entirely into gasoline may be realized. An instance is cited of an American oil company that is planning to provide facilities for this undertaking. The economic aspect of the project is discussed.

Tar and Oil Section

"Cracking of Tar Acids from Coal," Dr. J. C. Morrell, assistant director of research, Universal Oil Products Co., Chicago, Ill.; Gustav Egloff, director of research, Universal Oil Products Co. The authors show that on the basis of the annual production of bituminous coal in the United States the potential yield of tar acids is 90,000,000 bbls. annually. It is pointed out that low-temperature carbonization is rapidly coming into its own and that the proper disposal of the tar may mean the difference between profit and loss for the process. The authors have been previously shown that high yields of antiknock motor fuel can be obtained from the cracking of the tars. In the present work the high-boiling tar acids are converted by cracking into low molecular weight tar acids or phenols possessing greater toxicity and hence greater value for sheepdip, wood preservatives and other antiseptic uses.

"New Catalytic Processes for the Utilization of Coal Tar Crudes," Dr. Alphonse O. Jaeger, technical director The Selden Co., Pittsburgh, Pa. A new and effective process of purifying coal tar crudes, especially crude anthracene, by selective catalytic oxidation of the impurities, using new classes of contact masses is described. Solvent purification of crude anthracene is accomplished with a new inexpensive solvent surpassing in efficiency all of the known solvents hitherto used. New catalytic vapor-phase oxidations of relatively impure coal tar crudes permit the production of practically chemically pure anthraquinine from crude and semirefined anthracene.

Combined catalytic and solvent processes for the purification of coal tar crudes make possible the production both of purified anthracene and phenanthrene from crude anthracene.

SATURDAY

General Session

"The Cracking of Low-Temperature Coal Tars. The Berginization of Low-Temperature Coal Tar in Presence of Catalysts," Dr. A. E. Dunstan, chief chemist Anglo-Persian Oil Co., London, England. The author discusses investigations of the possibility of modifying the thermal decomposition of low temperature coal tars so as to obtain more valuable products, particularly motor fuels, from such tars than have been obtainable in the past. It is shown that the spirit hydrocarbons obtained are amenable to refining, but that losses are heavy. The hydrocarbons have antiknock properties similar to those of benzol, and are suitable for blending with certain petrols.

Low Temperature Distillation Section

"Commercial Aspects of Low Temperature Coal Distillation and the International Bitumenoil Corp. Process," J. A. Vandegrift, research engineer, International Bitumenoil Corp., New York. The paper reviews briefly the depression in the bituminous coal industry. Low-temperature carbonization is suggested as a means of converting the cheap raw coals into more valuable and varied by-products of a broad market and thus restoring and maintaining prosperity to the industry. The possibilities are indicated of profitable operation of low-temperature carbonization plants in various localities in the United States.

"Some New Aspects of the Economics of Coal," Dr. Jacobus Gaarts, director, Privaat Instituut voor Technologie, Dongen, The Netherlands. The author declares that modern coal technology does not necessarily lead to removal of the coal crisis. It is pointed out that production of more oils of better quality by means of low temperature distillation can only partially solve the oil problem. The technical objection of the Bergius process is said to be the necessity for high pressure and the production of hydrogen. The fundamental objection to this process is ascribable to the nature of the fuel obtained. Application of carbonalpha as motor fuel (carbonalphine) by occlusion of heavy oils in carbonalpha, or by mixture with ash-free powdered coal is explained. Way of burning carbonalphine in the motor and possibility of simplifications of motor technique are considered.

CALIFORNIA NATURAL GASOLINE MEETING

(Continued from Page 41)

ciency of extraction of natural gasoline, and the gas lift are in a great measure responsible. The question of the utilization of natural gasoline goes hand in hand with the question of overproduction. In the past few years utilization of natural gasoline in California has increased more than 50 per cent, but the accompanying increase in production has always resulted in a net increase in the amount of natural gasoline put into storage at the end of the month.

How Industry Can Attack Problem

"The industry can attack the problem from two angles, to endeavor to increase the utilization to the maximum, and to endeavor to decrease the production to where it will approximately equal utilization.

"All natural gasolines consist primarily of the hydrocarbons propane, iso-butane, butane, and the heavier or base material commonly referred to as 'pentanes and heavier.' This base material is substantially the same for the great majority of natural gasolines. It is the so-called "butane-free" natural gasoline and will have ordinarily a recovery on Engler distillation as high as that of ordinary straightrun gasoline. Starting with this

base material it is only necessary for us to find out exactly what percentage of butane can be included with this base in the finished natural gasoline to give the refiner a product for blending which will best satisfy his requirements. Doctor Brown's excellent work on the question of vapor lock will give us information as to the maximum volatility or vapor pressure permissible in natural gasoline for the purpose of blending up finished motor fuel.

"New specifications will have to replace the present meaningless specifications of gravity, distillation recovery and I.C.C. vapor pressure. These new specifications will possibly consist of some modified form of the Engler distillation, together with an absolute vapor pressure determined by the Reid or Beistle method, or some modified or improved form thereof. Ultimate analysis will be a great aid in drawing up these new specifications. After we have determined what product, or products, will best suit the refiner's need, then it will be up to the industry to manufacture only those products which we can expect the refiner to utilize. This will result in a decrease in production of natural gasoline, but the decrease in quantity will be more than made up by the increase in value, both to the natural gasoline manufacturer and to the refiner. It is true that in thus curtailing production an economical waste is involved, in that part of the butane and all of the propane which is extracted from natural gas will be wasted until further outlets are opened for these materials, or by-products made from these materials. Our next most important problem, therefore, would be to develop these outlets. Perhaps this would be a fruitful field for co-operative research.

Most Useful Products

"Overproduction will continue unless we ourselves take steps to limit our product to that which is most useful to the refiner. Statistics show that natural gasoline is produced in direct ratio to the quantity of light oil produced in California. The average production is about 3.8 gallons of natural gasoline per barrel of light crude produced. Unless there is some logical reason for assuming that the supply of light crude in California will decrease materially with respect to the supply of heavy crude, there is no logical reason for expecting that the ratio of natural gasoline produced to straightrun gasoline produced from the crude will decrease. This situation will also be aggravated by the continued increase in the production of cracked gasoline. Therefore, I venture to predict that we can expect the overproduction to continue and stocks of natural gasoline on the Pacific Coast to continue to rise unless we ourselves take steps to make production and utilization of natural gasoline more nearly equal.

New Contracts

"I would not want to create the impression that I was pessimistic about the future of the natural gasoline industry. Never has the industry been on a better footing than it is today. The point I wish particularly to stress is that the more we apply ourselves to the problems of the industry, the more information that we gather about our product and its uses, and the more we try to anticipate the future, the more uniform and dependable will be the progress of the industry. In the past it has been the custom to purchase and sell natural gasoline in California on long term contracts of from one to five years, the price being based on a differential under the service station price of motor fuel. Without intending or implying any criticism of what has been done before, I do not believe that such sales contracts should be made for longer periods than one year because of the fact that one or the other of the parties to such agreements is almost always penalized, due to the fact that the service station price of motor fuel does not always bear any direct relation to the value of natural gasoline. If contracts were made only for periods of one year or less it would have a very important stabilizing effect upon the industry and in the long run would benefit both the seller and the purchaser.

"In conclusion, let us resolve, therefore, to attempt to do three things during the coming year:

"Determine what product or products we must make to enable the refiner to best utilize the maximum quantity.

"Operate our plants to make this or these products.

"Develop markets and special uses for such hydrocarbons as as cannot be included in our finished natural gasoline."

PANHANDLE FIELDS

(Continued from Page 47)

No. 1 Norton was dry and abandoned at 1,884 feet.

Clay County

Lone Star Gas Co.'s No. 21 Stine estate made 25 bbls. at 1,774-85 feet.

Jack County

O'Neil and others' No. 1 Powell was dry and abandoned at 606 feet.

Wichita County

Lomas and The Texas Company's No. 1 Chilson was dry and abandoned at 1,950 feet. Coleman & Coppack's No. 1 Denny was dry and abandoned at 1,580 feet. T. J. Cottom's No. 1 Michie made 4 bbls. at 789-99 feet. W. H. Hammon's No. 5 McCarty-D made 70 bbls. at 1,285-1,337 feet. United Producers' No. 3 Hodges swabbed 250 bbls. at 1,477-94 feet.

Wilbarger County

Waggoner Refining Co.'s No. 3 Waggoner-I swabbed and flowed 800 bbls. at 2,360-2,404 feet.

Young County

Albright's No. 1 Green was dry and abandoned at 946 feet. Allday & Carter's No. 5 Johnson made 8 bbls. at 562-78 feet. Creath & Kell's No. 1 Nall was dry and abandoned at 551 feet. Their No. 1 Wright was dry and abandoned at 830 feet. Humble & Pruitt's No. 1 Hill was dry and abandoned at 1,152 feet.

Kleiner and others' No. 8 Davis made 40 bbls. at 548-63 feet. Mook-Texas Oil Co.'s No. 10 Davis was dry and abandoned at 630 feet. Riggs, Oliphant & Williams' No. 1 McKinley was dry and abandoned at 750 feet. Their No. 2 McKinley was dry and abandoned at 580 feet. Their No. 3 McKinley was dry and abandoned at 580 feet. Riggs and others' No. 20 McKinley was dry and abandoned at 596 feet. Their No. 21 McKinley made 25 bbls. at 490-516 feet. Their No. 5 Sweet was dry and abandoned at 580 feet.

Smith and others' No. 1 Grubbs was dry and abandoned at 602 feet. Union Oil Co.'s No. 1 Wilson was dry and abandoned at 1,015 feet. Wise & Jackson's No. 2 Calvin made 42 bbls. at 590-95 feet. Root and others' No. 1 Shanafelt was dry and abandoned at 4,102 feet. Schermerhorn Oil & Gas Co.'s No. 4 Thompson made 30 bbls. at 2,054-58 feet, encountered water sand at 2,227-40 feet, after which it plugged back to 2,115 feet.

PANHANDLE DISTRICT

Brown County

Ballard's No. 1 Baugh was temporarily abandoned at 848 feet. Clark Buffalo Oil Co.'s No. 2 Keesee was dry and abandoned at 1,806 feet. Hammon & Garrett's No. 6 Curry was shot with 30 quarts at 1,068-78 feet and dry and abandoned at 1,086. Humble Oil Co.'s No. 6-A Allen made 9 bbls. at 1,121-42 feet. Midwest Exploration Co.'s No. 4 George made 24 bbls., 50 per cent water, at 1,317-28 feet.

Root & Rhodes' No. 1 White was dry and abandoned at 1,318 feet. Amerada Petroleum Corp.'s No. 1 Edwards was dry and abandoned at 658 feet. Cunningham and The Texas Company's No. 1 Brooks was dry and abandoned at 1,351 feet. Lockhart & Co.'s No. 1 Gordon was dry and abandoned at 1,980 feet. Riordan and others' No. 1 Pugh was dry and abandoned at 1,507 feet. Stephens' No. 1 Kirkpatrick was dry and abandoned at 1,140 feet.

Callahan County

Moutray Oil Co.'s No. 4 Hatchett was dry and abandoned at 373 feet. Reiter-Foster Oil Co.'s No. 4 Hatchett made 5 bbls. at 339-47 feet. Its No. 5 Hatchett made 60 bbls. at 339-47 feet. Stratton's No. 1 McDaniel made 5 bbls. at 307-40 feet. The Texas Company's No. 7 Hatchett made 25 bbls. at 340-58 feet. Its No. 8 Hatchett made 6 bbls. at 351-53 feet.

Coleman County

Forster's No. 4 Davenport was dry and abandoned at 950 feet. Logan & Carter's No. 1 Burk was dry and abandoned at 1,391 feet. Speer and others' No. 1 Jones was dry and abandoned at 486 feet. Continental, Anzac and others' No. 2 Sealy-Smith made 30 bbls. at 1,604-14 feet.

Dunnigan & McCrady's No. 3 Rice was dry and abandoned at 1,170 feet. Price's No. 1 Lefeure-Sticking was dry and abandoned at 2,395 feet. Taylor-Link's No. 1 Stewardson was dry and abandoned at 2,570 feet. The Texas Company's No. 2 Hayes was shot with 4 quarts at 1,141-51 feet and made 25 bbls. Tower & McKana's No. 2 Moody made 312 bbls. at 1,848-54 feet.

Erath County

Cowen and others' No. 1 Graves was dry and abandoned at 3,580 feet.

Eastland County

Arkansas Fuel Oil Co.'s No. 12 Connelle made 10 bbls. after having been shot with 14 quarts at 1,232-50 feet. Chestnut & Smith Corp.'s No. 1 Harrell made 40 bbls. after having been shot with 30 quarts at 4,155-70 feet. Dale Oil Co.'s No. 12 Fox made 18 bbls. at 1,600-10 feet. Parsons and others' No. 1 Calvert was shot with 40 quarts at 3,073-93 feet and made 5,500,000 feet of gas. Andrews Petroleum Corp.'s No. 1 Kyle location was abandoned. Clark and others' No. 1 Ferguson was dry and abandoned at 1,710 feet.

Palo Pinto County

Texas Pacific Coal & Oil Co's No. 1-A Robinson was dry and abandoned at 1,755 feet.

Stephens County

Dorothy Oil Co.'s No. 1 Thorp made 5,094,000 feet of gas at 1,697-1,700 feet. Wentz Oil Co.'s No. 1 Elliott was dry and abandoned at 4,097 feet.

Shackelford County

Cranfill & Reynolds' No. 1 Flippin made 36 bbls. oil and 27 bbls. water at 905-16 feet. Oyster, Rife & Taylor's No. 1 Davis location was abandoned. Tannehill and others' No. 1 Davis was temporarily abandoned at 840 feet. Zoch and others' No. 1 King was dry and abandoned at 2,002 feet. Root and others' No. 1 Hitson had an initial production of 770 bbls., now making 300 bbls., 50 per cent water, from lime at 3,227-48 feet.

WEST TEXAS FIELDS

(Continued from Page 48)

Survey, Section 13, Block 19, T.P. Survey, made 782 bbls. at 2,514-15 feet.

Kent County

Phillips Petroleum Corp.'s No. 1 Sandell, 330 feet from south and 2,310 feet from east line of Section 429, Block D, H.&T.C. Survey, had a hole full of water at 3,320 feet and was dry and abandoned at 4,194 feet.

Runnels County

Gibson & Johnson's No. 1 Rainwater was dry and abandoned at 2,940 feet. Jones Oil Syndicate's No. 1 Hale, 212 feet from north line and 150 feet from west line, Section 109, E.T.R.R. Survey, was temporarily abandoned at 2,210 feet. Kennedy and others' No. 1 Tally, 1,200 feet from north line and 800 feet from east line, Section 534, V. V. Kenon Survey, was dry and abandoned at 3,015 feet.

Pecos County

California Co.'s No. 1 Tippett, Lease No. 1, topped the pay at 1,363-85 feet and made 22 bbls. per hour pinched. McDonald and others' No. 1 Porcell, located in C NW SE, Section 28, Block A, G.C.& S.F.R.R. Survey, was abandoned at 100 feet.

Winkler County

Atlantic Oil Producing Co.'s No. 1-H Hendricks, 2,310 feet south and 1,650 feet east of NW cor. Section 30, Block B-5, topped the lime at 2,785 feet and had an initial production of 100 bbls. daily at 2,856-3,035 feet. Murchison Oil Co.'s No. 4-A Hendricks, 1,650 feet south and 990 feet west of NE cor. Section 35, Block B-5, was temporarily abandoned. Prairie Oil & Gas Co.'s No. 1 Cowden, 2,310 feet south and 330 feet west of NE cor. Section 3, Block 12, topped the lime at 2,455 feet, had an oil and gas show at 2,790 feet, and had an initial production of 150 bbls. per hour at 2,790-2,907 feet. Republic Production Co.'s No. 5-B Hendricks, 330 feet east and 990 feet south of NW cor. Section 41, Block B-5, P.S.L. was dry and abandoned at 2,380 feet. Roxana-The Texas Company's No. 10-A Hendricks, 330 feet south and west of Section 29, Block B-5, P.S.L., topped the lime at 2,690 feet, topped the pay at 3,013 feet, was drilled to a total depth of 3,019 feet and had an initial production of 800 bbls. hourly. The same company's No. 4-E, located 330 feet north and 990 feet west of SE cor. Section 39, Block 26, P.S.L. Survey, topped the lime at 2,377 feet, made 10,000,000 feet of gas at 2,560 feet, had an oil show at 2,591-2,600 feet, topped the pay at 2,778 feet, was drilled to a total depth of 2,788 feet and had an initial production of 608 bbls. hourly. Southern Crude Oil Purchasing Co.'s No. 5 Hendricks-T-67-B, located 330 feet south and 990 feet east of NW cor. Section 44, Block 26, topped the lime at 2,665 feet, topped the pay at 2,800-10 feet, was drilled to a total depth of 2,920 feet and had an initial production of 20 bbls. per hour, 4 per cent water. Southern Crude Oil Purchasing Co.'s No. 1 Hendricks T-88-D, located 2,310 feet south and 330 feet east of NW cor. Section 4, Block B-12, topped the lime at 2,486 feet, had an oil show at 2,735 feet, and had an initial production of 1,550 bbls. per hour at 2,735-2,890 feet. Its No. 5 Hendricks T-88-I, located 1,650 feet north and 990 feet east of SW cor. Section 30, Block B-5, topped the lime at 2,725 feet, topped the pay at 2,820 feet, was drilled to a total depth of 2,998 feet and had an initial production of 500 bbls. per day. Its No. 13 Hendricks T-88-M, located 990 feet north and 1,650 feet west of SE cor. Section 33, Block 26, topped the pay at 2,805 feet, was drilled to a total depth of 2,819 feet and had an initial production of 200 bbls. per hour, 50 per cent water. Its No. 5 Hendricks T-88-T, located 330 feet south and 990 feet west of Section 34, Block 26, P.S.L., topped the lime at 2,391 feet, encountered an oil show at 2,660 feet, topped the pay at 2,795 feet, was drilled to a total depth of 2,800 feet and had an initial production of 150 bbls. per hour.

Late Fields

(Continued from Page 46)

Refining Co. has the best well completed in Shelby County in the 10 years that locality has been prospected, and Magnolia Petroleum Co. has a good producer from a stray deep sand found in a patch of barren ground in the Oil City district of Caddo. Gulf Refining Co.'s No. 1 Pickering, in the P. W. Harvey Survey, blew in from 3,382 feet with about 5,000,000 feet of gas and a spray of oil, getting stronger as it blew until it is now flowing 144 bbls. of 39 gravity crude with the same amount of gas, from a horizon not heretofore prospected. It is thought in some quarters to have located the long sought Shelby County Pool. Gulf and Magnolia Petroleum Co. own practically all the acreage surrounding the new wildcat producer.

Magnolia Petroleum Co.'s No. 3 Levee Board in Section 7-20-15, Caddo Parish, came in while bailing late Sunday flowing 50 bbls. an hour of 35 gravity pipe line oil from 17 feet of broken sand, total depth 3,012 feet. The location is on the southern fringe of a patch of territory about a mile in area in which wells drilled to shallower levels at which wells produced elsewhere in Caddo were failures, and is producing from a sand not found at its depth in other pools in the parish.

GULF COAST

HOUSTON, Tex., Nov. 20.—The impetus given the new shallow sand are

of the South Liberty Field by the completion of two more 1,000-bbl. producers Monday was given a setback Tuesday when the discovery well, Sun Oil Co.'s No. 10 Mitchell, stopped flowing suddenly, probably, because of lack of gas pressure, and when The Texas Company's No. 13 Staiti, south offset to the discovery well, failed to flow. The latter with oil standing in the hole probably will be put on the pump from the sand at a total depth of 885 feet. Sun Oil Co. completed two shallow wells Monday. No. 12 Mitchell, 100 feet east of the discovery well, flowing 1,000 bbls. from sand at a total depth of 1,031 feet, and No. 13 Mitchell, 100 feet north of the discovery well, flowing 1,000 bbls. from sand at 873 feet.

The discovery well, which came in November 2 from sand at 875 feet making 1,200 bbls. and which increased to 1,600 bbls. has been flowing at the rate of 1,300 bbls. daily the past week. Gulf Production Co.'s No. 1 Chambers, west offset to the discovery well, continues to flow between 800 and 1,000 bbls. daily. Three other tests in this district are due to be completed Wednesday.

At Pierce Junction, Shaw and associates' No. 2-C Fitzsimmons was brought in Monday flowing an estimated 800 to 1,000 bbls. daily from sand at approximately 3,790 feet.

R. G. Hare, Prairie Pipe Line Official, Dies of Pneumonia

INDEPENDENCE, Kans., Nov. 18.—R. G. Hare, treasurer and a director of the Prairie Pipe Line Co., died at his

R. G. HARE

home here today from double pneumonia which set in from a cold, contracted a week ago. He had been confined to his bed three days.

Mr. Hare was one of the five original directors of the Prairie company who were still serving on the board.

He was born June 21, 1880, at Allegheny, Pa., and while young began work with the Forrest Oil Co. of Pittsburgh, Pa. In 1902, he was transferred to the Eureka Pipe Line Co. and the same year he took up his duties with the South Penn Oil Co.

In 1903, he was sent to Neodesha, Kans., as treasurer of the Prairie Oil Co. and was named treasurer and director of the Prairie Pipe Line Co. when that firm was organized in 1915. His sudden death ended 13 years' continuous service on the Prairie directorate.

MARKEY IMPROVING

Charles Markey, of the Link Belt Co., suffered an attack of influenza during his trip through the Mid-Continent and returned to his home in Indianapolis where he is improving.

UNOFFICIAL CHANGES BRING A NEW UMPIRE FOR THE HENDRICKS POOL

FORT WORTH, Tex., Nov. 19.—A change in the executive personnel of The Texas Company's Fort Worth division resulted in the changing of umpires in the Winkler County proration plan.

J. A. Bermingham, who has been assistant to L. E. Barrows, division manager for The Texas Company in the Fort Worth division, was elevated and made production manager for The Texas Production Co., headquartered at Denver, Colo.

REED ALSOBROOK

Mr. Bermingham is widely known in Texas and one of the most genial members of the fraternity in Texas. He came to the Lone Star State during the Spindletop boom and later did some independent work before accepting a position with the Simms Oil Co. Later he was associated with The Texas Company.

HAROLD N. PARDEE

The Texas Production Co. operates in Utah, Wyoming, Colorado, Montana and Canada and has approximately 8,000 bbls. of production in the states.

He was succeeded in Fort Worth by H. N. Pardee, formerly umpire in the Hendricks Pool, also widely known in Texas, and whose climb from tool dresser to umpire of the Hendricks Pool was described some months ago in The Oil and Gas Journal.

Mr. Pardee has moved to Fort Worth and assumed his new duties.

Reed Alsobrook, assistant to Mr. Pardee in the Hendricks Pool, has been appointed by the Winkler County Advisory Committee to succeed Mr. Pardee as umpire. Mr. Alsobrook is a veteran in Winkler County proration work, having aided in organizing the proration machinery for the plan.

He has had many years of experience both in the field and in office work for various oil companies. Mr. Alsobrook was born in Taylor County, Texas, 40

J. A. BERMINGHAM

years ago and obtained his education at the Merkel high school and the Abilene Christian College.

FREDERICK K. COPELAND DIES ON EASTERN TRIP

Frederick Kent Copeland, president of the Sullivan Machinery Co. since 1892, died at Claremont, N. H., November 10. He was on a visit to the company's eastern works at Claremont, when he was taken ill. It became necessary to operate for appendicitis, death resulting two days later.

Mr. Copeland was born in Lexington, Mass., and was graduated from Massachusetts Institute of Technology in 1876. After several years spent in Iowa and Colorado in mining engineering work, he helped organize the Diamond Prospecting Co. in 1884, and became its president. This company engaged in contracting with the Diamond Core drills made at Claremont, N. H., by the Sullivan Machine Co.

In 1892 the two companies were merged, with Mr. Copeland as president. Under his leadership Sullivan products were developed for a wide range of purposes, serving the mining, quarrying, construction and manufacturing industries, manufactured at plants at Claremont, N. H., and Michigan City, Ind., and a world-wide sales organization has been built up.

In the recent presidential campaign, Mr. Copeland was chairman of the Chicago Engineers' Committee for Herbert Hoover. A telegram received by Mrs. Copeland from Mr. Hoover said, "I am grieved to learn of your husband's death. We have lost a great engineer, and friend."

MR. MORAN IN PONCA CITY

D. J. Moran, president of the Marland Oil Co., arrived Tuesday in Ponca City, Okla., the headquarters of the company, to take up his new duties. Mr. Moran recently resigned as vice president of The Texas Corporation to take the presidency of the Marland organization.

MUSKEGON FIELDS

(Continued from Page 88-A)

SE SE Section 5-10-16, and C. M. Bowers' No. 1 Hower, SE SE Section 5-10-16. The Paragon-Tripp well came in with 15,000,000 feet of gas and a spray of 300 to 400 bbls. of oil. The other blew the mercury from a gauge strong enough to test a 20,000,000-foot well. It is estimated it has an open flow capacity between 25,000,000 and 30,000,000 feet a day, one of the largest gassers in the field.

Two other wells were added to the completions making a total of 98 wells in exactly 11 months to a day. One of the new completions is the Muskegon Development Co.'s No. 2 Zuidema well, NW SW Section 8-10-16, which came in at the rate of 22 bbls. an hour. This is nearest to the record No. 1 Zuidema which came in with an initial flow of 1,300 bbls. from the upper Traverse formation.

Kelley Goldboss' No. 1 Marquard, SW SE Section 7-10-16, was finally abandoned.

Brien and Brien's No. 1 McDermott, SW SW Section 10-10-16, was shot in the upper Traverse and will be drilled to the lower Traverse and possibly to the Dundee.

Gas had been encountered in the Puritan Oil Co.'s No. 1 Plunkett, SE SE Section 8-10-16, in the upper Traverse at 1,621 feet. Upper Traverse gas also had been encountered in the United Oil & Gas Co.'s No. 1 Cooper, NE SW Section 8-10-16, at 1,584 feet. No production is anticipated until the Dundee at about 2,000 feet.

Including all but the completed wells in Muskegon Township there are 66 locations on which wells are drilling, rigging, spudding or on which there is no activity yet.

New locations this week total 11: C. M. Bowers' No. 2 Seiner, SW SE, Section 5-10-16; O. C. Daniels' No. 1 Kieft, SW NW, Section 7-10-16; Natural Gas & Oil Co.'s No. 1 J. Lewis; Richard Boter and others' No. 1 L. Becker, NE SE, Section 5-10-16; Diamond Oil & Gas Co.'s No. 1 Jager, SE SE, Section 5-10-16; Maire-Caswell-Kidder, trustees' No. 1 Pappas, NW SE, Section 4-10-16; Ma-Ha-Goo Co.'s No. 2 Mahoney, SE SE, Section 5-10-16; Continental Motors Corp.'s No. 1 fee, SW SE, Section 15-10-16; E. M. Self and others' No. 1 Charles Gilbert, NW NE, Section 7-10-16; Great Western Oil & Gas Co.'s No. 1 Cecil F. Warren, SE NW, Section 4-10-16; and E. G. Thompson and Delbert Fordney's No. 1 Mathies Trierweiler, NE NE, Section 6-10-16.

Laketon Township

J. B. Reed was preparing to drill in the second well in Laketon Township as the Reed Oil Co.'s No. 1 Young, SE NE, Section 11-10-17, a direct west offset to Carl Prather's No. 1 Thompson.

Nine other wells are drilling at varying depths in this vicinity. A new location for Laketon Township is L. E. Kennedy's No. 1 L. J. Fenner, SW SW, Section 1-10-17, a total of 19 locations on the majority of which operations have been started.

Muskegon County Wildcats

Three locations may be added to Muskegon County wildcat wells: Muskegon Development Co.'s No. 1 F. E. Haas, SE SW, Section 29-9-14, a test well being drilled for the Muskegon Oil Corp. and the Dixie Oil Co.; L. C. Patterson's No. 1 Loretta, SW SE, Section 13-12-15, Holton Township; and Eureka Oil & Gas Co.'s No. 1 Featherstone, SW, Section 35-11-16, Dalton Township.

Western Michigan Wildcat Wells

The best progress among the western Michigan wildcat wells is being made by the Lima Oil Corp.'s No. 1 Atwood, SE SW, Section 6-11-13, Ashland Township, Newaygo County, drilling at about 1,400 feet and expecting to reach the red rock any time. Edward DuVall's No. 2 Carrie Mears, NW SW, Section 31-15-18, Golden Township, Oceana County, is drilling at about 800 feet.

Spring Lake Oil Co.'s No. 1 Ed Voss,

Old Timer Says—

"WITH THE ELECTION OVER AND PROSPECTS FOR BETTER CONDITIONS IN THE FIELD, FOR THIS COMING YEAR, WE SURE GOT A LOT TO BE THANKFUL FOR THIS THANKSGIVING.

"THE PARMACO BOYS ARE FIGURING ON HEAVY RATIONS AND A LITTLE EXTRA 'SHUT-EYE' FOR NOVEMBER 29TH—BUT IF ANY OF YOU FRIENDS IN THE FIELD GET INTO TROUBLE ON THANKSGIVING AND NEED ANY PARMACO PRODUCTS — JUST WIRE OR PHONE—AND THE STUFF WILL BE SHIPPED TO YOU.

"THE PARMACO BOYS —LIKE PARMACO PRODUCTS — NEVER DISAPPOINT THEIR CUSTOMERS."

LOOK FOR THE ORANGE AND BLACK HEADS — PARMACO COLORS SINCE 1921

Write for Catalog.

PARKERSBURG MACHINE CO.

PARKERSBURG, W. VA.

"The House of Courteous Service"

SW SE, Section 14-8-16, Spring Lake Township, Ottawa County, is setting 8-inch pipe at about 350 feet.

The Mid-Continent Development Co.'s No. 1 George Easley has been fishing for a sledge hammer and other debris thrown into the hole. The culprit has not been apprehended.

The Saukey-Beam well on the property of G. A. Beam, NW SE, Section 22-14-15, Newfield Township, Oceana County, is about ready to spud in. The Paul Schulte Oil & Gas Co.'s No. 1 Blanchard, Section 31-10-10, Kent County, is shut down at 1,200 feet.

A new location is the Pennsylvania Oil & Gas Co.'s No. 1 Bert Snow, NW SE, Section 23-15-15, Oceana County.

ROCKY MOUNTAIN AREA

(Continued from Page 88-A)

superintendent for the Parker Club, will be in charge of operations. This is intended as a test to the Pennsylvanian. Drilling crews are now at the well and are making preparations for winter work. The boilers are being moved back as a precautionary measure because of the gas found at 1,500-1,700 feet in three other tests drilled on that structure to shallow depths in the past.

In Larimer County the Union Oil Co. of California's No. 1 Cleary-Larson-Krause, SE SW NW Section 19-8-68, on the Fort Collins Dome, previously reported a temporary completion, was deepened from 4,593 feet to 4,610 feet and recompleted with an initial production of 100 bbls. It increased to 105 bbls. the second day and 121 bbls. the third day. Same company's No. 1 K.W.&B., SW cor. NE Section 19-8-68, on the Fort Collins Dome, was completed with an initial production of 70 bbls. The sand was found at 4,640-85 feet. The Union company has commenced spudding on its No. 2 Elder, NE SW NE Section 18-9-68, on the Wellington Dome. On the Round Butte structure, north of the Wellington Dome and near the Wyoming line, Stanley Barrows' No. 1 Barrows, NW cor. SE Section 7-11n-68, is drilling at 1,895 feet. This well is through the Muddy sand, which showed a little oil and 600 bbls. of water per day, and is also through the Dakota sand within 30 feet of the top of the Lakota. The Dakota also had a good show of oil, about three times as much as in the Muddy, and 100 bbls. of water. If the Lakota is found to be barren, it is probable that the well will be carried on down to the Sundance, which has never been tested in northern Colorado and which is expected at 280 feet below the top of the Lakota.

There was one completion in the Florence-Canon City district in Fremont County, this being the Continental Oil Co.'s No. 5 Ben Steinmier, SE SW Section 35-18-70, completed at 1,810 feet. It made 110 bbls. first 24 hours on the pump, and is expected to settle to about 40 bbls.

Wyoming

A substantial showing of gas in a new horizon in the joint well of the Red Feather Oil Co. and the Producers Oil & Gas Co. on the Baggs structure in Carbon County, Wyoming, immediately north of the Colorado line, was an important development of the week. This wildcat is located in the SE SW SW Section 35-13-92, and is approximately 50 miles due east from the Hiawatha Dome, which straddles the line between Sweetwater and Moffat Counties on the boundary of the two states and farther to the southeast from the Baxter Basin gas field. The Baggs well encountered a flow of approximately 3,000,000 feet of wet gas in the middle Green River formation of Tertiary age at 646 feet, some distance above the first objective.

Another wildcat that will receive considerable attention when it begins to reach the deeper horizons is the Producers & Refiners Corp.'s No. 1, SW NE NE Section 7-57-97,on the South Frannie, or Sage Creek structure in Park County, just north of the Montana line. The hole is bottomed at 593 feet, and the 15½-inch is being run. This well is approximately 3 miles to the southeast of the R. H. Rosenberg, and others' No. 1, Section 25-58-98, on the Frannie structure, the discovery well which came in last August at 2,600 feet and which has been making better than 300 bbls. a day from a horizon now believed to be just above the Embar. The two operations are on separate domes, but contours embracing both highs have been worked out showing a closure of 1,800 feet, or a closure comparable with the Salt Creek Field.

Montana

Crude oil is becoming scarce for the small refiner in Montana. There are a number of skimming plants in the northern part of Montana that are in a precarious shape on account of no crude oil supply. During the past week the Maple Leaf Oil & Refining Co., operating a refinery at Coutts, Canada, just across the line from Sweetgrass, announced a premium for crude amounting to 20 cents per barrel. The posted price in the field is $1.75, and this is the highest market in the Rocky Mountain region for a low-gravity crude. Sunburst oil is a black oil with a gravity between 30 and 32 degrees. The larger oil firms have contracted all the oil they could secure and thus have tied up production so that as the field declines the smaller fellows find themselves up against it to secure enough oil for their skimming plants.

Two wells of vital interest to the oil men of the northwest country are being drilled, one in Wyoming and one in the foothills of the Belt Mountains in central Montana. These two wells are to make a test of the Devonian fomation that lies close to the granites, and should production be found there, it will start a drilling campaign all over this region that will surpass the boom days of a few years ago.

The Devonian formation has been known to carry showings of oil and gas in Montana, but a producer has never been developed in these horizons. Up to now, the oil men have rather ignored the Devonian, and early geologists doubted its existence, but the Standard Oil Co. of California has started a deep test on Section 35-5-7e, on what is known as the Ringling Dome.

Pondera Producer

Pondera Field is easily the high light this week in Montana oildom. Lou Sontag brought in a well of good size up in the NW cor. of Section 11-27-4, about 1½ miles from the nearest producing well. The well is placed at 75 bbls. This adds a considerable area to Pondera, for up to now the field has been held mainly on Section 15-27-4, Section 10 on the north and Section 16 on the west having a few wells, but most of the producers are on Section 15.

Besides the Sontag completion on the Miller, the Ponting, Rice, State on Section 16-27-4 is in the pay and a producer, and the Rice Oil Co.'s No. 3 on the Burke lease on Section 15-27-4 is also a producer of good size. The same company also brought in its No. 6 on this lease and has a good well of about 60 bbls.

The California Petroleum completed its No. 2 Copley and No. 4 on Section 15-27-4, Copley lease, and each well is good for more than 50 bbls. natural. The same company also completed two wells on the Lingsbury lease, Nos. 7 and 8, and also on Section 15, and both are producers.

Sunburst Completions

Sunburst Field brought in three nominal producers the past week, and these three wells are well inside production. Work in Sunburst is shutting down for the winter, and the operators there are not expecting any new developments of importance before next spring.

The contract for the royalty oil from government lands in the Cat Creek Field was declared void at the same time the Government declared the Salt Creek Field royalty oil to the Sinclair interests void and as a result the Lewistown Oil & Refining Co. is without enough crude for its plant.

The State Land Commission of Montana will open bids November 30 for the state royalty oil from all state lands in Montana. This contract will go into effect December 1.

The Midwest Refining Co. has purchased the holdings of the Montana Pacific Oil Co. in Pondera and is moving in four string of tools at once. The lease consists of 280 acres.

ROCKY MOUNTAIN PRODUCTION
Runs From Field Week Ended November 1

WYOMING	
Salt Creek	36,240
Big Muddy	2,680
Grass Creek	2,410
Elk Basin	910
Ferris	60
Rock River	2,610
Lance Creek	270
La Barge	2,410
Poison Spider	1,020
Oregon Basin	4,340
Osage	440
Mule Creek	570
Lander	540
Byron	30
Lost Soldier	3,720
Simpson Ridge	70
Dutton Creek	90
Pilot Butte	240
Rex Lake	160
Hamilton Dome	720
Total Wyoming	59,590
MONTANA	
Cat Creek	1,540
Lake Basin	350
Kevin-Sunburst	8,200
Pondera	2,000
Total Montana	12,190
COLORADO	
Florence	1,300
Moffat	1,270
Fort Collins	2,540
Iles Dome	1,880
Rangely	100
Tow Creek	640
Boulder	20
Total Colorado	7,680
NEW MEXICO	
Rattlesnake	670
Hogback	500
Artesia	1,060
Cap Rock	197
Table Mesa	
Total New Mexico	2,428
Total Rocky Mountain	81,890

OKLAHOMA FIELDS

(Continued from Page 121)

Roxana:				
Harber	22- 9-6		2	178
Lasley	22- 9-6		2	28
Sinclair:				
Carter	13- 9-6		2	23
Cudjo "A"	35- 9-6		6	910
Cudjo "B"	35- 9-6		4	657
Dicey	22- 9-6		2	160
Fixico	23- 9-6		4	800
Slick:				
Cudjo	35- 9-6		3	750
Franks	35- 9-6		6	1,750
Giblet	35- 9-6		3	1,560
Tiger	1- 8-6		1	10
Superior:				
Cudjo	35- 9-6		4	250
Texas:				
Mayhue	14- 9-6		1	270
Strothers	2- 9-6		1	120
Tidal:				
Carter	24- 9-6		4	480
Fixico	26- 9-6		6	1,260
Harjo	25- 9-6		3	240
Harjo, T.	23- 9-6		5	100
Turman:				
Cudjo	35- 9-6		4	550
Grisso	35- 9-6		1	80
Jones	34- 9-6		4	920
Total		286		43,340
Searight Pool				
Amerada:				
Johnson	4- 9-6		1	40
Strothers	3- 9-6		2	1,000
Barnsdall:				
Jackson	5- 9-6		1	20
Carter:				
Davis	4- 9-6		6	420
Frazier	3- 9-6		6	3,160
Johnson	3- 9-6		1	10
Kilker	2- 9-6		1	20
Mandler	3- 9-6		2	30
Scott	26-10-6		1	10
Gypsy:				
Cudjo	4- 9-6		3	600
Mid-Continent:				
Grayson	34-10-6		6	60
Saloche	33-10-6		5	870
Nevins	32-10-6		1	870
Pine:				
Lula	4- 9-6		1	20
Prairie:				
Cannon	33-10-6		1	30
J. Carter	10- 9-6		1	40
Houch	33-10-6		1	40
Kincaid	33-10-6		2	60
Wimer	22-10-6		1	10
Pure:				
Aldridge	3- 9-6		4	1,170
Roxana:				
Strothers	3- 9-6		4	160
Sinclair:				
Polly	3- 9-6		4	1,120
Superior:				
Varnum	4- 9-6		1	40
Texas:				
Fleet	4- 9-6		1	20
Twin States:				
Varnum	4- 9-6		2	50
Wilcox:				
Chupco	4- 9-6		8	610
Total		67		10,440

Totals		
Field—	Wells	Prod
Little River	301	109,13
Maud	7	2,20
Mission	12	52
Bowlegs	312	50,10
Earlsboro	285	77,90
Seminole	286	43,34
Searight	67	10,44
Grand total	1,270	293,70

Simple, fool-proof, can't be put on wrong. Can be applied in ten seconds. Tapered pin locks it with a bulldog grip.

Every Rotary Drilling Outfit Needs GRIP-TITE *Casing Guards*

IT prevents metal-to-metal contact between casing and drill pipe, couplings and tool joints — and provides ample clearance for over-shots.

A hammer is the only tool required for applying Grip-Tite—and, when attached, no blow or pull can move it in any direction. It can be removed as easily as it is applied.

Grip-Tite saves 25% to 33⅓% in power, and permits higher drilling speed. Eliminates excessive friction and prevents water leaks due to casing wear. Protects drill pipe from twist-off due to shock and crystallization and permits deeper drilling with each size of hole.

THE B. F. GOODRICH RUBBER CO.

Factories: Akron, Ohio, and Los Angeles, Calif.

Branches—1386 East 7th St., Los Angeles, Calif. 650 Second St., San Francisco, Calif. 2625 Walnut St., Denver, Colo. 1201 Young St., Dallas, Texas. 2422 Broadway, Kansas City, Mo. 285 S. Peters St., New Orleans, La. Other principal cities. Distributors in all fields.

Also manufacturers of "1788 Highflex" Transmission Belting, High-Pressure Rotary Drilling Hose, Silvertown Heavy Duty Pneumatic Tires, Solid Tires, Hi-Press Boots and other products for the Oil Industry.

Goodrich

Rubber Products for the Oil Industry

Of Interest to Sales Departments

OIL USED BY SHIPS TO QUIET TROUBLED SEAS

Pouring oil on troubled waters is not a new practice but the more modern ships are being equipped with tanks filled with oil set at advantageous points along the ships side for quick and effective use. A description of the use is given in Oil-Power, the house organ covering lubrication of the Standard Oil Co. of New York.

Pounded and harassed by seas that threatened to snap her in two, the S. S. Northern Star, down from Duluth, lurched and groaned with a cargo of grain in her hold. Seas astern kept the decks awash and then—a crash! Blue water down her funnel and a steel hatch cover wrenched off! Lake Erie, shallowest of the Great Lakes, showed her teeth in the gale.

A last resort—the captain opened the storm oil tanks and waited for the crash that might come any second, even before the oil could prove its "highly tooted" worth. But the crash never came. The oil flowed serenely toward the stern. It floated to the top of the water, coating it with a layer of oil that refused to be ruffled by the hurricane-wind, and gave the ship a chance to regain her balance and make port.

Pouring oil on troubled waters has long been recognized by mariners as an effective means of stilling turbulent seas. In fact, on the high seas, the practice of carrying oil tanks (and in the old days, oil buckets made of leather) filled with "storm oil" has been a standard practice since clipper ships sailed the main.

However, the practice of outfitting Great Lakes freighters and passenger liners with tanks for storm oil is comparatively new. Yet many a fresh water skipper can tell you tales of how he saved his ship a wallowing from lashing winds and high seas by turning the petcock on the storm oil tank and releasing its load in the stormy waters around his ship.

The arrangement of these tanks on board a vessel is designed to give the ship the greatest possible protection in a storm. Tanks containing storm oil are placed in the bow of the ship. A steam pipe from the engine room maintains a high enough temperature in the tanks so the oil will flow freely in cold weather. Thus, the discharge pipe from the tank to the sea is so planned that the oil will flow from the bow to the stern.

BUS FARES EXCEED SIX MILLION

If the consumption of gasoline by busses may be judged by the amount of money collected annually as fares in Texas, the $6,000,000 now being collected in that State shows the extent to which this means of travel has already developed.

Bus operators have 33,000 miles of routes in Texas compared with 16,500 miles of railroad in the State. One of the most notable instances of proposed motor bus invasion of remote territory not yet penetrated by any railroad was contained in the application by R. C. Bowen of Fort Worth, president of the West Texas Coaches, Inc., for permit to establish a bus line between San Antonio and Pecos, 442 miles.

Route of the proposed bus line is 50 to 75 miles removed from any railroad for a good part of the distance. On the route are a number of towns, including Boerne, Kerrville, Junction, Sonora, Ozona, Sheffield, Fort Stockton and Balmorhea. A double daily schedule of buses is proposed. It was stated at the hearing of this application that the cost of constructing a railroad between San Antonio and Pecos would be approximately $16,000,000.

GERMANS MAKE THOROUGH TESTS OF MOTOR FUELS USED IN AIRPLANES

By Charles E. Kern
Washington Bureau, The Oil and Gas Journal

The tests used in Germany on aviation motor fuels cover practically every phase of their usefulness and a paper delivered by E. Rackwitz and A. Non Philipovich at the London World Power Conference recently, fully explains the purpose and results of these tests.

The fuel used for aviation in Germany is mainly petrol obtained from mineral oil. Fuel made from lignite has also been used, and petrol-benzole mixtures are frequently employed. Fuel containing additions of antiknock compounds, such as tetraethyl lead and iron carbonyl, have been tried experimentally. Aeroplane fuels are tested in Germany for the following values in use:

Antiknock value.
Chemical composition.
Specific gravity.
Boiling range.
Ignition value.
Behavior on cooling.
Corrosive properties.
Gumming.
Sulphur content.
Calorific value.
Latent heat of vaporization.
Inflammability.

Compression Ratio

The compression ratio of German engines lies between 1:5.5 and 1:6.3. The ratio of 1:6.3 is such that it is exceedingly difficult to find a suitable fuel. When petrol-benzole mixtures are used the compression ratio of the petrol must be approximately 1:5.5, in order that the ultimate benzole-petrol mixture may possess the required ratio. More than 60 parts of benzole must not be added, as higher benzole contents adversely affect the properties of the mixture when exposed to low temperatures.

The test for the compression ratio is carried out either directly, in a single cylinder engine with variable compression, or indirectly in an engine with fixed compression by comparison with a known fuel. The German Air Research Institute has devised a special testing unit with variable compression for this purpose. It is regrettable that no standard fuel has been universally adopted for indirect compression ratio tests. Graham has suggested the use of a mixture of heptan and iso-octan, but the suggested mixture is very costly. It is also of importance that some international agreement be arrived at for the comparison of the effect of addition of various antiknock compounds.

Chemical Composition

The aniline point of pure aviation petrol must lie below 52 degrees Centigrade. When petrol-benzole mixtures are used an aniline point not exceeding 58 degrees Centigrade is permissible. The percentage of unsaturated compounds must be less than 2 per cent. The compression ratio test cannot be substituted by chemical analysis, although such analysis is of great importance in itself. Any attempt to calculate the compression ratio from the chemical analysis is unsatisfactory and gives only approximate results.

Specific Gravity

The specific gravity of aviation fuel must exceed 0.710. The specific gravity is only of importance when coupled with the boiling point range.

Boiling Point Range

When tested in Engler-Ubbelohde's apparatus, aviation fuels should possess the following boiling point range:

First drop	50-60°C.
Distillate	10% up to 70°C.
	60% up to 100°C.
	80% up to 120°C.
	96% up to 130°C.
Dryness	140°C.

Petrol-benzole mixtures should have the following ranges of boiling points:

First drop	50-60°C.
Distillate	10% up to 75°C.
	60% up to 110°C.
	80% up to 130°C.
	96% up to 150°C.
Dryness	160°C.

Petrol containing more than 10 per cent of hydrocarbons with boiling points below 70 degrees Centigrade should be excluded owing to high evaporation losses. The German Air Research Institute has not yet completed its investigations upon the effect on the oil dilution of constituents of high boiling point.

Ignition Value

This value is expressed by the quotient of the spontaneous ignition temperature and the oxygen requirements of the fuel. The fuels obtained by use of Yentzsch's apparatus, according to experiments carried out by the German Air Research Institute, are not entirely satisfactory and concordant results are not easily obtained. In spite of this it has been clearly shown that petrols having widely varying boiling point ranges and chemical compositions also show great variations in ignition values. The ignition value is also altered in a marked manner by addition of benzole or other antiknock compounds.

Behavior on Cooling

It is essential that aviation fuel should be capable of withstanding temperatures as low as 30 degrees Centigrade. Crystallization and separation of the spirit into different layers must not take place above this temperature. The properties on cooling are estimated in Stelling's apparatus. The initial crystallization point of benzole-petrol mixtures depends upon the crystallization temperature of the benzole, and it is, therefore, necessary that the benzole component does not begin to crystallize above 15 degrees Centigrade. Experience gained during the present year has shown that trouble has been encountered due to crystal formation in feed pipes and tanks at temperatures of only 15 to 18 degrees Centigrade, in spite of the fact that the fuels in question in laboratory tests had shown crystallization points considerably below these temperatures. The properties of an aviation fuel in regard to separation into layers is determined by means of Ostwald's test, by shaking together 100 cubic centimeters of fuel with increasing quantities of water until a point is reached at which the mixture becomes permanently turbid.

Corrosive Properties

Test for the corrosive properties of aviation fuels are carried out by the German Air Research Institute in the following manner: A piece of copper foil in which aluminum or magnesium rivets have been inserted is introduced into the fuel. If the fuel has corrosive properties the presence at the junction of the two metals of aluminum or magnesium hydroxides becomes apparent after about 24 hours. The presence of sulphur compounds is indicated by the discoloration of the copper. A second method employed by the institute consists in passing large quantities of fuel over a small piece of the metal in question, and the American "Copper Dish" method is used as a third method of testing.

Gumming

Aviation fuels must possess no gumming properties. Both corrosive sulphur and di-olefines are considered as gumming constituents.

Sulphur Content

Squire's method is used for the estimation of sulphur, the content of which should lie below 3 per cent. They also use 0.5 per cent sulphur without fear of corrosion gasoline.

Calorific Value

The net calorific value of aviation fuel should not lie below 8,500 calories per kilo. The estimation is carried out in Junkers' calorimeter or in the Berthelot-Mahler bomb. This comparatively low calorific value limit permits the use of alcohol-containing fuels, but any further reduction in the calorific value must necessarily seriously effect the radius of action of the machine.

Latent Heat of Vaporization

This is only of importance in conjunction with fuels containing alcohol.

Inflammability

In view of the great risk of fire on crashing, etc., it would be highly advantageous if a less inflammable fuel could be obtained, but unfortunately this desideratum is not easily reached owing to the fact that the use of a fuel with high ignition and boiling points is impracticable.

PLANE PRODUCTION MOUNTING

Possibly the oil industry will see a growth in the production of airplanes beyond all expectations as we pass into 1929, and certainly this new field for petroleum products stands out as the greatest factor in the expansion of markets for the future. By the close of this year approximately 700 airplanes will be manufactured monthly, and already the total average has exceeded 600. With this great number of planes finding a market, the several cars of gasoline consumed daily by aviation only a few years ago will rapidly multiply itself many times, and no accurate estimate may be made of what the ultimate consumption might amount to. More than 10,000 numbers have been issued by the United States Department of Commerce, and while this number does not indicate the number of planes in use, it serves as an index of the activities. At present there are more than 2,300 planes in active service. New companies are entering the field; practically all the leading old-line companies are increasing their operations constantly. The airplane business for 1928 is said to be fully 300 per cent greater than it was in 1927 and there are many who believe that 1929 will show an increase as great as in the current year.

INCREASE IN GASOLINE TAXES

CHICAGO, Nov. 17.—According to a survey made by the Automobile Club of Illinois there were at the beginning of 1928 only three states without a gasoline tax. Massachusetts, New York and Illinois depended on usual taxation such as license fees, personal property assessments and bond issues for the construction of good roads. Forty-four states and the District of Columbia had gasoline taxes. Out of these 44 states, 24 states during 1927 increased their gasoline tax rate. At the beginning of that year the average rate, according to the Automobile Club of Illinois which made the survey in conjunction with the American Motorists Association, the average gasoline tax was 2.56 cents per gallon. By December 31 the average tax had been increased to 3.19 cents per gallon. The total amount collected during 1927 was $258,800,000, according to this survey.

New Type 28-3 Pennsylvania Tank Car equipped with Fluid-Fusion welded experimental car tank.

P.I.W. Presents the New Type 28

After months of careful research made in conjunction with leading railroad and transportation men in the Petroleum, Chemical, Iron and Steel and other industries the new P.I.W. built Pennsylvania Tank Car is offered.

This new car is of the high quality characteristic of the P.I.W. Products—it is strongly constructed according to accepted car building practice and embodies not only the experience of seasoned tank car builders and the best thought in modern tank car design, but also the recommendations of leading tank car users. In other words the new Pennsylvania Tank Car is the product of a first-class tank car building organization working out the carefully considered and experienced recommendations of the tank car users.

Three different types of the new car are offered, all of which are basically the same modern construction but designed to fit three price classes and differing only in respect to end sill and sub-sill construction. The car complies throughout with A.R.A. requirements and is built to give a long life of low-cost transportation.

Our nearest office will be glad to give you complete details of the new improved design.

P.I.W. Products

PENNSYLVANIA TANK CARS
STILLS—6" THICK WALLS
OIL REFINING EQUIPMENT
PRESSURE VESSELS
VACUUM VESSELS
AGITATORS
CHEMICAL PROCESSING EQUIPMENT
OIL STORAGE TANKS UP TO 120,000 BARRELS CAPACITY
ELEVATED WATER TANKS
PRESSURE PIPE LINES
PENSTOCKS
AUTOCLAVES
KILNS
DRYERS
ANNEALING BOXES
RETORTS
DIGESTERS
SPHERICAL VESSELS
BLAST FURNACE EQUIPMENT
CREOSOTING CYLINDERS
GALVANIZING KETTLES
EXCHANGERS
SMOKESTACKS
STEEL BARRELS AND DRUMS
GENERAL STEEL PLATE CONSTRUCTION

BRANCH PLANT — BEAUMONT, TEXAS.

THE PETROLEUM IRON WORKS COMPANY
SHARON, PA.
NEW YORK CHICAGO HOUSTON TULSA

Foreign Trend in New Motor Fuels

Many Experiments Under Way With Liquid and Gaseous Products. Using Fuel Oil for Truck Operation

By John H. Nelson

The operation of the new German airship, the Count Zeppelin, on Blau gas, the announcement by the Packard Motor Co. of a successfully developed fuel oil engine for airplane use and the English announcements of the Royal Automobile Club of Great Britain of successful runs of crude oil motors for truck and trailer use, all occurring within a period of two weeks, are of tremendous significance to the petroleum industry.

Blau gas is not a new fuel. The same gas in a form less pure has been used to light railroad cars and marine buoys in many countries for the past 25 years, later being displaced by acetylene and still later by electricity.

Blau gas contains a good many hydrocarbons unsaturated and because of this fact is a superior fuel for internal combustion engines. It has a specific gravity of 1.04 to 1.08 and recently Doctor Blau has claimed that he has his product down to a specific gravity of 1 which contains something like 1,800 B.t.u. per cubic foot. Its attractiveness as a dirigible fuel lies in the elimination of the constant shift in the center of gravity of the ship caused by the progressive exhaustion of gasoline or other liquid fuels when used. The necessity of releasing the hydrogen or helium is also reduced to a minimum.

The fuel oil airplane engine of the Packard Motor Co. is not a pioneer in this line of development. An English company, Beardmore, has been working with these motors for years and the United States Navy has been experimenting with two of these motors at the Naval aircraft factory, Philadelphia. It it is also understood that a new company has been formed in Los Angeles for the commercial production of a fuel oil burning airplane motor.

Diesel Type Plane

The Packard motor is a radical air-cooled type and develops 200 horsepower. It involves the use of the Diesel principle and eliminates the use of gasoline, ignition systems, carburetors, spark plugs and other devices contributing so largely to present type airplane motor troubles. The three major advantages claimed by the designers are: Elimination of fire hazard, reduction of fuel consumption and cost, it being claimed that the motor will carry a plane 25 per cent farther with the same weight in oil fuel compared with gasoline, and elimination of electrical interference which permits wider use of radio communications.

Up to the present time the lightest Diesel engine plant built weighed 100 pounds per horsepower but a weight of 3 pounds per horsepower is claimed for the new Packard motor.

Incidentally, the British propose to use fuel oil motors in the monster British Zeppelin which is larger than the Count Zeppelin and is expected to arrive in the United States next spring.

Truck Operation

In England the Royal Automobile Club of Great Britain began a series of tests with crude oil (probably fuel oil) as a fuel for auto trucks, in respect of a new German invention for handling heavy oils as motor fuels.

Two Mercedes-Benz trucks using heavy oil fuel in these tests have the following results: No. 1 test (truck with trailer)—Distance run, 51½ miles; total running weight, 19 tons 15½ cwt.; load carried, 12 tons 5½ cwt.; fuel consumption, 6.58 miles per Imperial gallon, equal to 130 ton miles per gallon gross, or 80 ton miles per gallon net; average speed, excluding stops, 7.9 miles per hour. No. 2 test (truck only)—Distance run, 691¾ miles; total running weight, 11 tons 12½ cwt.; load carried, 6 tons 5¾ cwt.; fuel consumption, 13.48 miles per Imperial gallon, equal to 156.5 ton miles per gallon gross, or 84.7 ton miles per gallon net; average, excluding stops, 17.7 miles per hour. The heavy oil used on the test costs between 7 to 8 cents per American gallon.

The advantages claimed for the new invention are primarily that the fuel used can be purchased for approximately 7 or 8 cents per American gallon; no magneto or carburetor is required, and that the overall ton mile cost can probably be reduced to about one-third of an ordinary gasoline driven truck.

If the claims made for this crude oil engine can be substantiated by actual tests, even in part, a considerable development in the consumption of crude petroleum for this purpose may be anticipated, and the final results of the present series of tests being carried on in London will be awaited with appreciable interest.

Alcohol Motor Fuel

Various companies in Great Britain have for some years endeavored to develop an alcohol motor fuel which could be used in part as a substitute for gasoline, but, thus far, due largely to the prevailing low price of gasoline, little headway has been made.

One of the principal British companies interested in this matter is the Distillers Co., Ltd., the largest group of alcohol distilling companies in the United Kingdom. It is now claimed that experiments made by this company or affiliated companies have shown that alcohol is twice as efficient as benzol in preventing knocking in an internal combustion engine. One of the principal results in this connection has been the production of a dry alcohol, and it is now stated that the Distillers company has put down a large unit at its Liverpool factory for the drying of alcohol by a French process, and find that the 7 per cent by weight of water contained in alcohol as ordinarily produced, can be removed at a very small cost, so that over 99 per cent absolute alcohol can be obtained which can be mixed with gasoline in any proportion.

A large unit capable of handling about 4,000 gallons per day on the same principle, has been sent to the Distillers company's Australian branch, and should be in full operation shortly.

It is expected to use the output of this plant mixed with gasoline in the proportion of about 15 to 20 per cent of anhydrous alcohol. It is claimed that this mixture is one of the most nearly ideal fuels yet developed as an antiknock fuel, and that it prevents, to a very large extent, the deposit of carbon in the cylinders and prevents damage to the lubricating oil.

British Malaya Plant

At the same time it is announced that the Nipah Distilleries of Malaya, Ltd., which was formed early this year for the purpose of producing alcohol principally for motor fuel purposes from Nipah Palm plantations in British Malaya, has purchased from a London firm, a complete alcohol producing plant, with a capacity of 7,000 Imperial gallons of alcohol per day, and this plant is now on its way to Malaya. This company has been working with the Distillers Co., Ltd., on technical matters connected with the development of a suitable alcohol motor fuel, and it is expected that arrangements will be made with gasoline distributing companies, similar to those entered into in Australia, whereby the gasoline marketing concerns take over the output of alcohol and sell the alcohol-gasoline mixture.

In view of the fact that England is dependent for the bulk of her motor fuel supplies on foreign sources, these developments in connection with the production and marketing of alcohol-gasoline mixtures under British auspices, are being watched with considerable interest.

Added interest is given to this general question of substitute motor fuels by the announcement that the Royal Automobile Club of Great Britain will organize in the spring of 1929 a comprehensive trial of motor vehicles run on fuels other than gasoline and benzol. No restriction as to nationality of entrants will be imposed, and the fuels tested are expected to include heavy fuel oils, gas solid fuels and alcohol fuels.

French Experiments

It is interesting to note that in France during the past two years numerous experiments and road tests have been made with gaseous fuels as substitutes for the imported gasoline. Town gas, methane, acetylene and producer gas (air blast, steam jet, mixed) have all been tried.

According to these French reports gas can be fed to an internal combustion engine in three different ways:

1. From reservoirs where it is stored at atmospheric pressure.
2. From cylinders where it is stored under pressure.
3. From plant for producing producer gas or nascent acetylene carried on the car.

Atmospheric Pressure

This process was tested some time ago in France and England on trucks and consists in filling a large rubber bag carried on the roof of the vehicle with combustible gas. The engine is connected to the bag by a pipe and inhales the gas until the supply of the latter is exhausted. The gas employed in these tests was town gas giving 5,000 calories per cubic meter. The explosive mixture composed of gas and air was formed in a mixer before being inhaled by the engine. This process was very quickly abandoned.

Its only advantages were the lightness of the gas bag and the ease with which supplies could be obtained from any gas works. On the other hand, the loss of gas by osmosis, the large volume occupied by a small supply of gas and the risk of fire were obvious defects.

Gas Under Pressure

It is possible to force certain gases under a high pressure (150 to 200 atmospheres) into metal cylinders. These recipients, therefore, contain a considerable volume of gas in a small space. Ordinary commercial cylinders would be suitable for use on motor cars if their weight were not prohibitive (a cylinder containing 1 cubic meter weighs 11 kilograms.)

This difficulty has recently been overcome by the appearance of very light electro-hooped cylinders on the market, weighing 3 kilos per cubic meter of gas carried. A cylinder containing 2 cubic meters is 0 m. 75 in length and 0 m. 16 in diameter. A light car could therefore carry at least two cylinders fixed to the footboards. The Paris Motor Omnibus Co. is now carrying out experiments on these lines. The feeding of an

(Continued on Page 164)

LIFTING OIL IN ATOMIZED FORM ADVOCATED BY GERMAN ENGINEER

A new method of oil lifting is described by a German engineer, J. Fitz, in Allgemeine Osterr. Chemiker u. Techniker Zeit. translated in the Petroleum Times of London, which says the method appears to be of sufficient importance to merit some attention. By the present methods of lifting oil from wells which have ceased to flow, the operation is either intermittent as by pumps, piston or bailer, or continuous. Experience has shown that of the first type the most economical is that which contains the most delivery periods in a given time unit. Only special properties of the oils make it desirable to use the less economical piston or bailer lift.

Because the number of delivery periods per time unit determines the economy, it is obvious that the constant delivery with air or gas mixed with the oil is the more advantageous, being double as great as by simple pumping, and two and one-half to three times as great as by the piston lift.

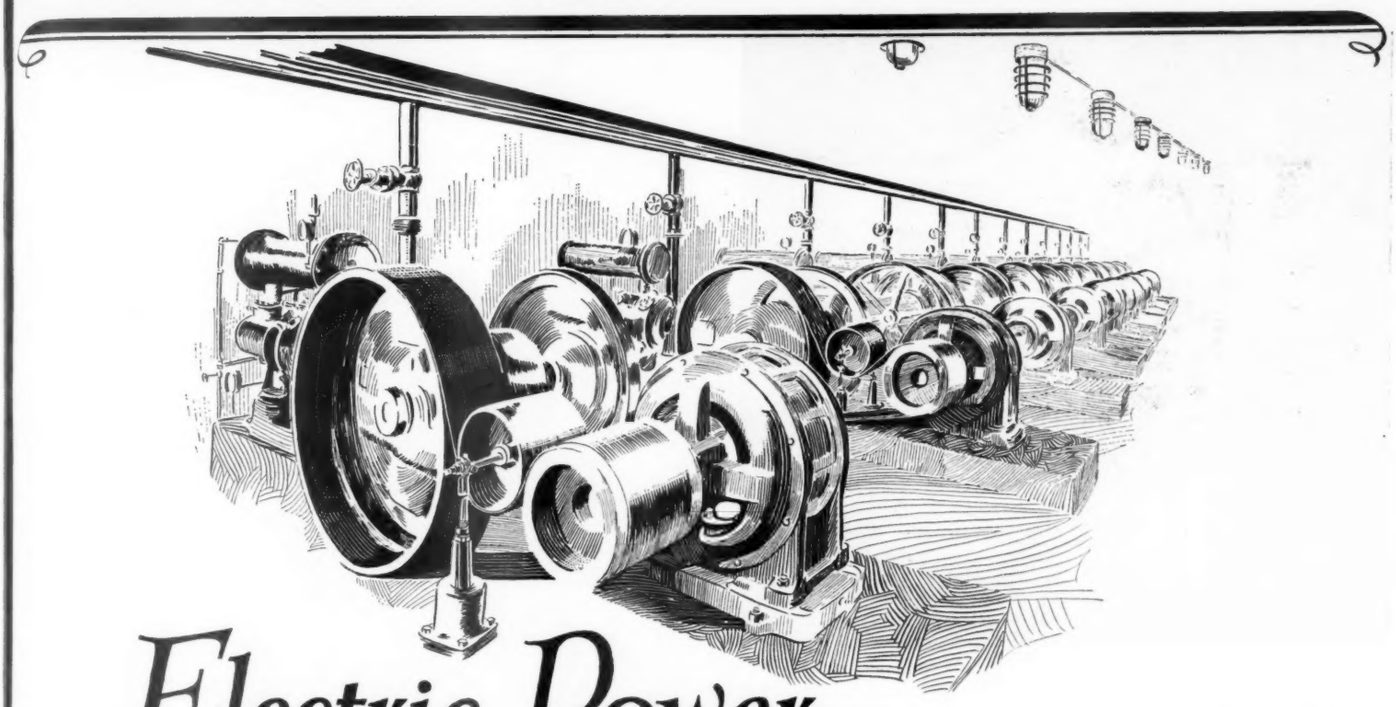
The theoretical performance can be calculated, but the power expenditure is many times greater than that indicated by theoretical considerations. The piston oil delivery with eight lifts per hour, from a depth of 1,300 feet, required 450 seconds for each delivery, of which 170 seconds will represent the time taken for the actual delivery. The theoretical work for a depth of 1,300 feet will amount to 20 horsepower, but the actual expenditure is about 200 horsepower, because of the weight of the cable (2,200 kilograms) and the piston, when it is at its lowest point in the well. Taking into account the useful power of the machine, the actual horsepower to be provided is about 350 horsepower, as, besides the weight of cable and piston, there is the friction of the oil on the walls of the delivery pipe which increases with the square of the speed of travel of the oil through the pipe. The average power required is about 170 horsepower over the whole lift, which gives a useful effect of 12 per cent. This can be reduced to 63 horsepower by recovering part of the energy and the useful effect is thereby increased to about 30 per cent.

With a continuous delivery the conditions are very different; the theoretical power required is about 7.6 horsepower and this condition can be reached if the oil is mixed with air, or preferably oil-gas. But in all such systems the air or gas must be applied under high compression, which increases with the depth the oil has to be raised, and the creating of this high pressure involves several stage compressors, which involve in turn a large supply of cooling water, and the expansion of this highly compressed air or gas-oil mixture in the delivery pipe so lowers the temperature as to cause a separation out and accumulation on the delivery pipe walls of solid paraffin which reduces the internal diameter and the capacity.

The compression of the air or gas requires a large power expenditure, of which only a relatively small proportion actually performs work.

The question arises, therefore, whether these several disadvantages of existing methods can be avoided? Fitz maintains that they can by reversing the process of forcing air or gas into the oil, that is by forcing the oil in finely divided particles into an air or a gas stream in rapid movement. He says this can be accomplished very simply in the same way that grain, sawdust, and many other substances can be conveyed in an air stream. By means of formulae, Fitz shows that the required velocity of the air or gas stream is con-

(Continued on Page 164)



Electric Power

ELECTRICITY now holds a big place in the petroleum industry as an efficient power medium.

Our company supplied the industry 879,088 Kilowatt-Hours in 1920. This year, the total has grown to 243,774,778 Kilowatt-Hours and among the users today of ELECTRIC POWER are such companies as Carter, Magnolia, Empire, Tidal-Osage, Prairie, Texas, Oklahoma Pipe Line, Phillips Petroleum, Roxana Petroleum, Shaffer Oil & Refining, Sinclair Pipe Line, Cosden, Amerada, Gulf Pipe Line, T. B. Slick, Inc., and I. T. I. O. Surely, these big companies know what they are doing.

ELECTRIC POWER reduces operating costs—is quicker installed—initial investment and maintenance is less and production is increased due to continuous operation and uniform speed. Fixed charges are also reduced by motors taking the place of boilers, engines, gas, water piping and the lessened fire hazard reduces insurance expense.

For detailed information, address

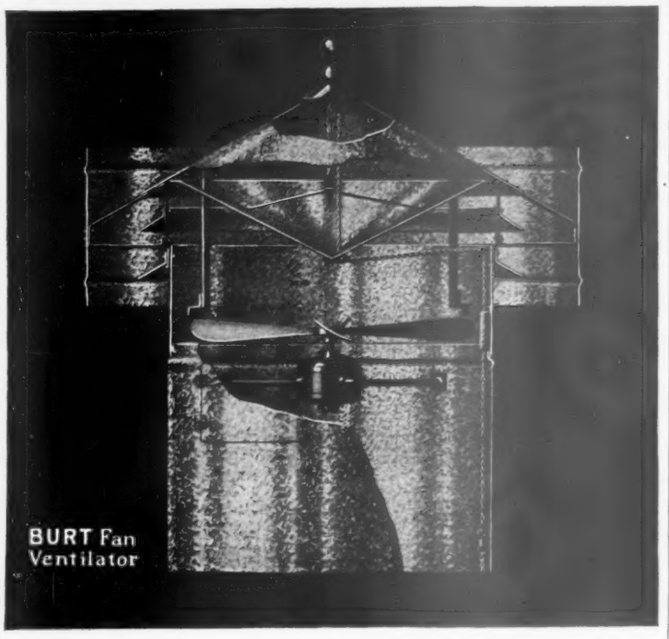
COMMERCIAL DEPARTMENT
OKLAHOMA GAS AND ELECTRIC COMPANY
OKLAHOMA CITY, OKLA.

OKLAHOMA GAS AND ELECTRIC COMPANY

J. F. Owens, Vice President and General Manager

BYLLESBY · OKLAHOMA GAS AND ELECTRIC COMPANY · PIONEERS IN PUBLIC SERVICE

Courteous Personal Attention to Every Customer



Closed Window Season Is Here

Time for coughing and sneezing, and all the other inefficiencies and dangers of bad air conditions in refinery buildings.

Because it definitely drives out bad air with a direct connected electric fan, the Burt Fan Ventilator will do the work of five or six ordinary gravity type ventilators. The initial cost for an effective installation is lower and the job better done.

Where conditions are not so bad, another style of Burt Ventilator may do the job. There is a size and type to meet every condition.

Factory built of metals 2 to 4 gauges heavier than other makes, Burt Ventilators last longer and work better. Let us figure on your ventilation problems.

BURT
Exhaust Heads

Save roofs, buildings, and boilers and they last a lifetime. Made in two types and sizes.

BURT
Oil Filters

Burt Oil Filters are cutting lubricating costs in thousands of plants. There is a type for every purpose and capacity.

The BURT MFG. Co.

Ventilators-Oil Filters-Exhaust Heads

929 S. High St. Akron, Ohio

OKLAHOMA PRODUCTION REPORT FOR THIRD QUARTER

(Continued from Page 104)

Name and address—	No. of bbls.	M. ft. gas	Amount
Graham, James H., Tulsa	6,320.64	.....	9,032.01
*Goltry, V. L., trustee, Enid	.....	.....	3,762.27
*Garber, M. C., Enid	.....	.....	9,401.10
*Gobogan, Annie, Wewoka	.....	.....	13,211.95
Getzendance, R. W., Waxahachie, Tex.	6,935.12	.....	8,576.11
Gaskill, M. E., Tulsa	32,003.93	.....	47,284.57
Grimes and Gillespie, Tulsa	33,818.24	.....	54,233.19
Gillespie, F. A., & Sons, Tulsa	22,000.64	.....	24,692.44
Garland, R. F., Tulsa	31,613.49	.....	47,086.59
Gypsy Oil Co., Tulsa	3,668,512.56	.....	5,297,438.40
Gypsy Oil Co., Tulsa	.....	2,574,809	225,038.38
Gypsy Oil Co., Tulsa (suspense)	.....	.....	21,354.00
Gypsy Oil Co., Tulsa	.....	467,649	48,532.86
Gypsy Oil Co., Tulsa (suspense)	.....	.....	74,295.95
*Goldsmith, Mrs. Edith, Chicago, Ill.	.....	.....	8,227.04
H			
Hanbury, Harry, Duncan	10,091.80	.....	12,607.64
*Hales, W. T., Oklahoma City	2,304.96	1,113	3,231.69
Hales, W. T., Oklahoma City	58,437.83	77,678	71,936.51
Harland Oil Co., Walco	16,139.52	59,700	21,755.50
Healdton Petroleum Co., Ardmore	.....	.....	14,544.56
*Healdton Oil & Gas, Enid	2,921.47	.....	4,503.88
Healdton Oil & Gas, Enid	13,876.46	.....	23,906.13
Hillside Oil Co., Tulsa	6,911.87	20,466	89,011.14
Houston Oil Co. of Texas, Houston, Tex.	3,570.51	40,039	6,659.52
Humble Oil & Ref. Co., Houston, Tex.	286,205.80	.....	320,229.03
Humble Oil & Ref. Co., Houston, Tex.	.....	.....	10,489.26
*Hopkins, A. N., Davenport	1,581.44	4,885	3,357.89
Hull, J. A., Co., Tulsa	61,462.40	142,194	91,851.40
*Home Stake Oil Co., Tulsa	.....	.....	171,863.50
*Homeho Oil Co., Okemah	.....	.....	6,285.63
Homaokla Oil Co., Oklahoma City	167,323.70	.....	206,496.19
*Homaokla Oil Co., Oklahoma City	10,613.51	.....	12,357.55
Home Gas Co. of Cushing, Cushing	4,164.20	.....	15,919.12
*Harber, J. N., Seminole	.....	.....	4,230.67
*Harber, Claud, Seminole	.....	.....	2,280.60
*Harber, W. E., Seminole	.....	.....	14,818.16
*Harber, R. T., Seminole	.....	.....	2,287.60
*Hartley, J. C., agent, Garber	.....	.....	7,162.78
*Hall, E. F., Okemah	.....	.....	3,995.97
Harris and Haun, Blackwell	.....	.....	25,867.25
*Haun, Carl B., Blackwell	.....	.....	3,571.29
*Hayden, John F., Tulsa	1,520.42	.....	2,180.60
Hayden, John F., Tulsa	4,726.54	.....	6,649.59
*Harris, E. L., trustee, Wewoka	.....	.....	21,131.04
*Harris, V. V., Oklahoma City	.....	.....	4,436.48
*Harris, Roy, Maud	.....	.....	3,947.13
*Harris, Bert, gdn., Maud	.....	.....	32,855.91
*Harris-Hays Co., Okmulgee	2,986.04	.....	4,518.27
Harreid, Ward, Oklahoma City	.....	.....	2,004.18
Hewitt Mineral Corp., Ardmore	.....	.....	7,838.86
*Hicks, George, Lindsay	.....	.....	2,087.12
Hall, F. C., and Powell Briscoe, Chickasha	7,212.06	87,339	6,872.16
Hull, J. L., and M. W. Jones*, Seminole	.....	12	4,519.68
Hughes, T. J., Cushing	.....	.....	5,588.27
Henderson Oil Co., Marietta, Ohio	6,196.36	.....	7,427.56
*Berry, Thos. N., and Harriett V., Stillwater	.....	.....	11,160.58
*Hill, P. J., Shawnee	.....	.....	9,325.38
*Hernstadt, Nora, New York City, N. Y.	.....	.....	4,639.27
*Hunter, W. L., Seminole	.....	.....	2,646.18
*Hammons, S. B., Seminole	.....	.....	6,764.50
*Hefner Oil Co., The, Oklahoma City	.....	.....	4,410.44
*Henn, Fitz, Blackwell	.....	.....	2,004.66
*House, W. E., Maud	.....	.....	2,397.51
*Hilltop Investment Co., St. Louis, Mo.	.....	.....	2,923.40
*Hunter, W. L., Seminole	.....	.....	2,646.13
*Homesley, U. C., Earlsboro	.....	.....	3,924.92
Howard, O. R., Tulsa	68,417.09	.....	104,651.51
*Horseley, Thos. J., Wewoka	.....	.....	2,778.75
*Hudson, Hargrove, Tulsa	.....	.....	22,646.00
*Howell, Mollie E., Wellington, Kans.	.....	.....	3,718.55
*Horton, E. N., Ardmore	.....	.....	2,272.70
Hambro Oil Co., St. Louis, Mo.	5,120.09	.....	6,392.60
*Hesslein, Max, New York City, N. C.	.....	.....	6,148.62
*Harmon, C. C., Nowata	1,580.73	.....	2,011.25
Harmon and Reed, Nowata	5,669.07	.....	7,177.37
Henry & Karcher, Tulsa	6,185.07	.....	5,054.87
Henry, J. W., Tulsa	7,411.87	.....	12,276.31
*Hemlock Oil Co., Tulsa	6,373.36	.....	9,648.58
*Hildt, Fred T., Tulsa	1,925.65	.....	2,881.90
Hazlett, A. G., Okmulgee	.....	.....	5,405.42
*Hull, J. L., Seminole	.....	.....	4,341.33
Halsell & Son Oil & Gas, Vinita	5,437.40	22,424	7,327.42
*Halsell, Ewing, Tulsa	.....	.....	2,020.34
*Halsell, Ewing, Tulsa	2,041.39	2,816	2,810.62
Harold Petroleum Co., Blackwell	.....	.....	17,041.36
*Hayes, J. S., Newkirk	.....	.....	2,541.06
Highway Oil Refining Corp., Tulsa	38,334.84	18,175	58,060.55
Harwell, E. P., Tulsa	.....	.....	6,202.89
*Horton, A. D., agent, Hawarden, Iowa	6,355.99	.....	6,999.47
I			
*Indian Royalty Co., Okmulgee	.....	.....	116,364.93
Interocean Oil Co., Tulsa	76,267.36	.....	109,622.99
*Investors Royalty Co., Tulsa	83,278.57	.....	123,769.44
*Imperial Royalties Co., Kansas City, Mo.	76,772.82	.....	111,244.85
*Indian Territory Illuminating Co., Bartlesville	40,329.13	39,819CH	60,544.09
Indian Territory Illuminating Co., Bartlesville	1,415,717.67	1,188,693 4,743,102CH	2,268,171.82
Irelan, O. M., Sapulpa	5,890.62	10,315	8,453.22
Imo Oil & Gas Co., Covington	.....	.....	15,164.32
Iron Mountain Oil Co., Tulsa	12,750.68	13,477	16,375.42
*Iron Mountain Oil Co., Tulsa	1,224.38	953	1,526.42
*Ingram, H. L., Shawnee	.....	.....	5,718.87
*Ingram, Leonard D., Cleveland, Ohio	.....	.....	2,123.22
*Ingram Royalty Co., Shawnee	.....	.....	2,470.27
*Ingram, J. A., Shawnee	.....	.....	30,481.20
Ice, A. B. and L. F., Tulsa	4,796.86	.....	8,258.34
Indiana Oil & Gas Co., Tulsa	26,519.09	21,691	40,800.50
Independent Oil & Gas Co., Tulsa	1,869,313.07	.....	2,867,717.14
Independent Oil & Gas Co., Tulsa	.....	Gas	88,066.32
*Independent Oil & Gas Co., Tulsa	14,534.73	.....	22,803.83
*Ingram, J. A., Shawnee	.....	.....	10,947.56
Ingram, J. A., Shawnee	.....	.....	4,767.08
J			
Jarvis & Holm, Inc., Tulsa	16,549.98	.....	21,992.60
Johnson Oil Refining Co., Chicago, Ill.	4,408.49	.....	6,118.83
*Johnston, Willard, Shawnee	.....	.....	7,082.18
Johnson, B. F., and Mary Eva, Fayetteville, Ark.	.....	.....	4,152.34
Johnson, C. O., and Geo. C. Pendleton*, Durant	.....	.....	3,685.56
Johnson, C. O., and Geo. C. Pendleton*, Durant	.....	.....	5,036.55
Johnson, Briton, Oil Co., Tulsa	6,752.71	.....	6,628.36
*Jones, J. Edw., New York City	.....	.....	7,096.24
Jones, R. C., & Co., Inc., Cushing	.....	.....	15,924.57
*Jones, Robt. L., Bristow	2,384.83	4,784	4,150.38
Jennings, E. H., Bros., Pittsburgh, Pa.	3,905.18	1,576	5,060.29
Jennings, R. G., Pittsburgh, Pa.	7,933.22	.....	12,786.62
*Jenkins, J. P., Okemah	.....	.....	3,995.97
Jackson, L. B., Sapulpa	.....	.....	12,998.16
*Jackson, L. B., Sapulpa	2,645.12	.....	3,799.89
Jackson, L. B., and W. A. Wise, Sapulpa	6,550.61	.....	7,397.49
Josey Oil Co., Tulsa	157,930.53	158,863	264,996.72
*Joines, U. S., Ardmore	.....	.....	5,073.40
Love, Mrs. Frankie, trustee, for Ralph W. Johnston, Dennison, Tex.	3,104.09	.....	3,450.07
*Jarvis-Zollinger and Andrews, Shawnee	.....	.....	17,622.36
Jacobs, Leo, St. Louis, Mo.	4,667.56	.....	5,599.07
*Jennings, Randolph P., Beverly Hills, Calif.	.....	.....	20,825.13
K			
*Knappenberger, Frank, Seminole	.....	.....	5,413.03
Knappenberger, D. L., Sapulpa	.....	.....	4,368.36
*Knotts, Sarah J., Stillwater	3,170.76	.....	5,022.95
Knupp Oil Co., Warren, Pa.	4,011.15	.....	4,992.23
*Killingsworth, M. E., Seminole	.....	.....	22,280.44
Kingwood Oil Co., Okmulgee	92,630.24	61,323	138,067.18

Foamite Generators in three sizes

For medium size and small oil tanks—for single tanks, or tanks in groups of two or three—in fact, for any tank, or tanks, where a two solution Foamite System may be too extensive for economical operation—the Foamite Generator offers the next best form of protection.

Foamite Generators are made in different sizes. A single Model 15 Foamite Generator will protect a tank 25 feet in diameter. One Model 25 will protect a tank of 45 feet. One Model 30 will protect a tank of 65 feet. Two or more will protect larger tanks.

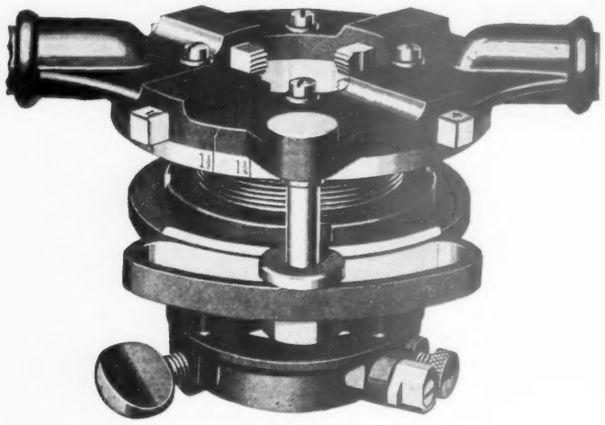
These ratings are conservative as dictated by sound engineering practice. This policy of conservatism together with high standards of design, construction and workmanship has been responsible for the success of the Foamite method of fire extinguishment.

If you would like information as to how Foamite Generators can protect your particular risks—call on the nearest American-La France representative. There are representatives at points convenient to all the principal oil producing and refining centers. American-La France and Foamite Corporation, Engineers and Manufacturers, Dept. F-20, Elmira, N.Y.

AMERICAN-LA FRANCE AND FOAMITE PROTECTION

A Complete Engineering Service

For Extinguishing Fires



11 Advantages of the NEW Nos. 11 & 11A BEAVER Die Stocks

No. 11—1 to 2 inch Plain
No. 11A—1 to 2 inch Ratchet

1 Light in Weight
The lightest die stock on the market threading 1, 1¼, 1½ and 2 inch.

2 Easy Working
As easy working as any 1 to 2-inch die stock on the market.

3 Self-Contained
No loose dies.
No loose bushings.

4 Adjustable
Adjustable to under or over standard without affecting the length of thread.

5 Simple in Construction
Surprisingly so. The minimum number of parts.

6 Durable
Made of the very highest quality of materials to insure long life.

7 Parts Interchangeable
Repair parts guaranteed to fit.

8 Low in Up-Keep Cost
Due to simple construction, high quality of materials and interchangeable parts.

9 Perfect Threads—Leak Proof Joints
The ONE set of dies used in Nos. 11 and 11-A Beaver Die Stocks thread 1, 1¼, 1½ and 2 inch iron or steel pipe perfectly and easily.
The threads will be found to be correct in pitch and shape, and as smooth as can be cut with any dies on the same piece of pipe.
Beaver dies are adjustable, and whether set to cut smaller or larger than standard, they produce the full length or number of threads on the pipe.

10 Cuts Drip Threads and Short Nipples
The improved work holder makes this possible.

11 Low in Price
No. 11 Plain $12.50 Net.
No. 11-A Ratchet $15.00 Net.
In California, Oregon and Washington:
No. 11 Plain $13.25 Net.
No. 11-A Ratchet $15.90 Net.

Stocked by All Leading Oil Field Supply Houses.

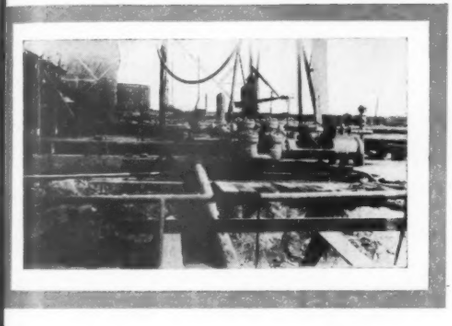
These two NEW Beavers replace our old No. 25 and 26 Beavers. They do everything these old tools would do, but are lighter in weight, easier working, simpler in construction and lower in price. We stand back of them just the same as we stand back of all Beaver tools.

THE BORDEN COMPANY, 514 Dana Ave., Warren, Ohio

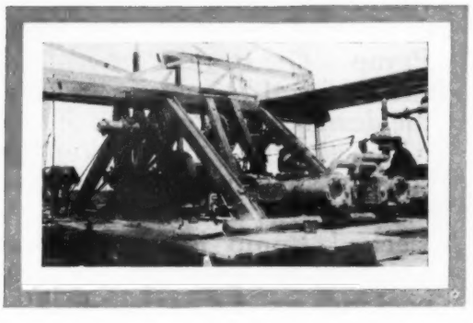
BEAVER
Time Saving Tools

Name and address—	No. of bbls.	M. ft. gas	Amount
*King, Helen Walker, Orange, Calif.			24,18
*King, Helen Walker, guardian, Orange, Calif.			7,36
King, J. T., Okmulgee	4,853.99		7,51
*Kearney, Robt. S., New York City, N. Y.			4,97
*Kearney, Robt. S., New York City, N. Y.			4,97
Keener Oil & Gas Co., Tulsa	42,921.94	36,604	51,34
*Keener Oil & Gas Co., Tulsa	1,384.00	46,340	2,09
Kay Oil Co., Blackwell	26,135.13		40,82
*Kays, W. O., Shawnee			6,92
*Kahle, Clyde, Cyril			7,84
Farmers State Bank, trustee for Kisner Royalty Co., Garber			3,11
*Kisner, R. R., Enid			3,60
*Kisner, Minnie L., Enid			3,69
*Kelly, Albert, Bristow			2,55
*Kennedy, Emma B., trustee, Okemah			9,40
Kewanee Oil & Gas Co., Titusville, Pa.	449,958.58	1,441	742,29
Kay and Kiowa Oil Co., Tulsa	6,494.41		10,16
Keystone Production Co. (Geo. L. Pace), Wichita Falls, Tex.	31,246.71		44,79
*Kimmel, J. D., Tulsa			2,23
*Knox, Chas. E., Enid	7,579.08	7,787	14,53
*Keck, L., and Stella, Nacona, Tex.			3,46
*Kistler, W. L., Inc., Tulsa			4,89
*Kimble, C. C., Beggs			6,30
Kirk Oil Co., Ardmore	6,053.27	23,157	7,70
Kreola-Colcord and Commerce Trust Co., Ardmore	9,416.09		10,04
Kreola Oil Co., Ardmore	11,220.00		7,07
L			
*Lamar Royalty Co., Tulsa	1,904.87		2,25
Liberty Royalties Corp., Tulsa	15,870.74		21,12
*Laughlin, R. W., Wewoka			5,57
*Laughlin, Nancy J., Cushing			2,59
*Laughlin, L. A., and W. T., Oklahoma City			5,22
Lasalle, T. E., Ada	14,653.02		19,89
Lawton Corp., Oklahoma City	1,153.95		5,17
*Lewis, A. W. Wade, Harlan, Iowa	5,803.57		9,08
*Lack, B. D., Co., Wewoka			15,09
Lack, B. D., Wewoka			7,17
Landon, A. M., Independence, Kans.	7,289.57	6,772	9,81
*Lahman, John, Altus			5,37
Lambert, C. K., and J. A. Spicer, Okmulgee			19,23
Laurel Oil & Gas, Tulsa	30,391.17	51,226	42,55
Large Oil Co., Bartlesville	4,333.19		6,19
*Little, T. J., heirs, Wetumka			3,98
Little Nick Oil Co., Chickasha			10,18
Link Oil Co., Tulsa	18,116.95		26,30
Lima Oil & Gas Co., Bartlesville	2,375.95	364,365	31,10
Lima Oil Corp., Oklahoma City			17,08
*Lindley, Florence, Sapulpa			10,45
Lone Star Gas Co., Dallas, Tex.	11,124.62	37,998	15,54
*Lytal, Henry, Oklahoma City			2,17
*Lynch, C. B., Tulsa			2,02
*Livermore, W. H., Inc., Chickasha			2,20
*Longmire, W. M., Oklahoma City			8,02
*Lebow, C. H., Tulsa			3,73
Lebow, C. H., Tulsa	12,081.90		19,07
*Levy, I. B., trustee, Oklahoma City	3,306.52		5,29
Lewis Production Co., Pittsburgh, Pa.	111,627.76		164,86
Leah and McCall et al, Nacona, Tex.	22,536.43		15,51
LeFlore County Gas & Electric Co., Poteau			10,95
*LaForce and Ferguson, Limon, Colo.			4,44
Louisiana Oil Refining Corp., Shreveport, La.	142,763.10	36,224	149,37
Ludey, Patty Spence, Marietta, Ohio	4,504.48		5,63
M			
McMahon, C. L., Inc., and C. L. McMahon, Tulsa	9,869.38		15,18
McMahon, C. L., Inc., and C. L. McMahon, Tulsa	39,834.51		61,29
McMahon, C. L., Tulsa	4,854.00		7,51
McMan Oil & Gas, Tulsa	56,022.94		83,71
*McMahan, R. M., trustee, Tulsa	4,062.14	35,368	7,58
*McBirney, J. H., Tulsa	1,551.94		2,07
*McBride, W. C., Inc., St. Louis			12,52
*McCaughtry, Floyd, Chickasha			2,06
*MacDonough, J. M., New York City, N. Y.			5,66
*McGee, H. G., Pauls Valley			5,27
*McGee, J. N., Asher			3,20
*McGee, R. L., Asher			33,64
*McGee, Jodie, Norman			5,65
McKee, S. H., Tonkawa			5,65
*McRoberts Royalty Co., Oklahoma City			3,46
*McDougal, D. A., Sapulpa			2,00
*McQueen, I. R., Oklahoma City	2,499.87		3,72
McQueen, I. R., Oklahoma City	6,538.70		9,02
McGraw Oil Co., Tulsa	18,896.81	9,712	28,64
Minnehoma Oil & Gas Co., Tulsa	69,035.07	174,538	114,21
Mid-Kansas Oil & Gas, Findlay, Ohio	232,180.09	190,459	354,89
Midco Oil Corp., Tulsa	17,247.10		25,86
Magnolia Petroleum Co., Dallas, Tex.	4,001,092.46		5,363,48
Magnolia Petroleum Co., Dallas, Tex.		Gas	186,26
*Magnolia Petroleum Co., Dallas, Tex.	52,194.34		80,12
*Magnolia Petroleum Co., Dallas, Tex.	6,959.66		11,07
Magnolia Petroleum Co., (suspense account) Dallas, Tex.			90,17
Magnolia Petroleum Co., (paid under protest) Dallas, Tex.			82,84
Mid-Continent Petroleum Corp., Tulsa	1,419,720.21		1,902,26
Mid-Continent Petroleum Corp., Tulsa		Gas	91,46
*Mid-Continent Petroleum Corp., Tulsa	7,760.90		8,39
*Monarch Royalty Co., Kansas City, Mo.			51,28
*Major Oil Co., Okmulgee			14,28
Merrick, F. W., Inc., Ardmore			30,55
Merrick, Ward S., Ardmore			6,43
Merrick, F. W., & Co., trustee, Ardmore	12,560.30		16,12
Morton & Co., Bartlesville	2,084.73	10,773	3,26
M. S. O. Oil Corp., Tulsa	4,094.43		5,39
Misener, F. D., Tulsa	8,945.67	558CH	10,78
Margay Oil Corp., Tulsa	141,653.71		209,14
*Martindale, E. B., Muskogee	1,374.99		1,98
Markham, J. H., Jr., Tulsa	57,156.63		85,86
*Markham, J. H., Jr., Tulsa	1,490.61		2,28
Madden and Madden, Tulsa	34,748.58		47,19
Malernee Oil Co., Oklahoma City	6,568.52	619	9,67
*Maxey, J. H., Oklahoma City			2,82
*Mayhue, Geo. M., Ada	2,229.13		3,14
Marileen Oil & Gas, Blackwell	9,744.80		14,86
Mason, D. B., Tulsa			15,13
*Mayes, E. L., Earlsboro			77,29
*Million and Thomas, McAlester	3,891.91		4,72
*Morton, Walter W., Okmulgee			2,46
Meridian Gas Co., Dallas, Tex.		100,912	8,39
Marquette Oil Co., Tulsa	14,812.34	59,247	24,65
*Metcalf, R. J., Fort Worth, Tex.			2,76
*Meadors, Frank, Jr., Wetumka	9,350.37		15,48
*Midland Petroleum Co., Wewoka			3,09
*Myers, Alice Clark, Santa Fe, N. Mex.			5,65
Metzer and Fultz, Muskogee			6,59
Morgan, Dudley D., Tulsa			23,57
*Morgan, Dudley D., Tulsa			2,24
*Mellon, R. F., Duncan			2,96
*Meier, John and Rosa, Winfield, Kans.			2,06
Mooers, Clifford, trustee, Wichita Falls, Tex.	4,823.49		6,24
Moseley, C. F., Bartlesville			3,36
*Moore, R. T., Oklahoma City			3,30
*Moore, J. Read, Wewoka			6,25
*Moore, Sy, Guthrie			3,04
Moore, Clint, estate, Tulsa	14,346.84		20,61
Mudge Oil Co., Pittsburgh, Pa.	18,883.46		13,85
Murphy Oil Co. of Pa., Philadelphia, Pa.	4,833.68		5,91
Murphy, J. F., Sapulpa			20,14
Mulberry Oil Co., Cushing	24,753.98	61,612	45,27
Mussellem, Sophia S., Muskogee	3,794.77		6,19
Mullendore, E. C., Cleveland			22,49
*Mullendore, E. C., Cleveland			5,82
Mullendore, Jennie, Cleveland			9,64
*Miller Bros. 101 Ranch, Marland			12,55
Minshall, E. R., Tulsa	4,090.31	829	5,90
*Meier, Albert and Hulda, Enid			2,06
*Meyer, Annie, Sapulpa			3,49
*Morris, H. E., Ada	1,930.00		2,19
Marland Production Co., Ponca City	423,317.80	1,432	727,48

TITUSVILLE



ROTARY EQUIPMENT



2555 Feet of Hole in 8½ Days—A Drilling Record Recently Established in Winkler County With a Complete Acme Rotary Rig . . .

Just read what Bass and Dutton, the drilling contractors who made this record, wrote to us. Then draw your own conclusions. An excerpt of their letter follows:

"After setting 200 feet of surface casing, this well was drilled to a depth of 2555 feet in 8½ days. So far as we are able to check, this well was drilled in one-half day faster time than any previous well drilled in this field for the Landreth Company.

The location of the second well was Roxa-Texas Co., Hendricks B-4, located in the North end of the field. After setting 350 feet of surface casing this well was drilled to a depth of 2378 feet in 8½ days. In drilling this well there was 24 hours shut down time because we lost returns. In drilling both of these wells we used only one Acme 14 x 7¼ x 16 Slush Pump.

Considering that this was a new rig, and had never been set up before, we are more than pleased with this splendid performance, and we do not hesitate to recommend Acme Rotary Equipment to any one who is in the market for Rotary Drilling Machinery."

The TITUSVILLE IRON WORKS Co.
TITUSVILLE - PENNA.

DISTRIBUTORS

The CONTINENTAL SUPPLY COMPANY

Titusville
Acme Boilers
Single and Twin
Steam Drilling Engines
Tico Gas Engines
Band Wheel and
Geared Powers

For Export
THE CONTINENTAL
WELL SUPPLY CO.
72-76 Trinity Court
New York City, N. Y.

TITUSVILLE OIL COUNTRY MACHINERY

For California
CALIFORNIA MACHINERY
AND SUPPLY CO.
2449-55 Hunter St.
Los Angeles, Calif.

Titusville
Acme Rotaries
Acme Swivels
and Speed Draw Works
High Pressure Boilers
Crown Blocks
Slush Pumps

RUGGED - ENDURING

Sensational Performance is just ordinary, every-day work for a

FLUID PACKED PUMP

FPP

Performance which sets the whole oil world to talking is chalked up all in a day's business with the Fluid Packed Pump. The Fluid Packed Pump doesn't extend itself to make records; it's all in the design, the principles of construction, which give the Fluid Packed Pump, at the start, a staggering advantage over ordinary designs and principles. The Fluid Packed Pump is manufactured on an anti-friction principle. It has no cups, packing or any tight-fitting, wearing parts. Its packing is fluid and it is composed of tubular barrels, telescoped one over the other. Ease of operation is apparent even from the description. Let us acquaint you with it thoroughly.

Manufactured only by the Fluid Packed Pump Company, Los Neitos, California. Distributed in the Mid-Continent by Robert N. Atmore Company, Tulsa, Oklahoma.

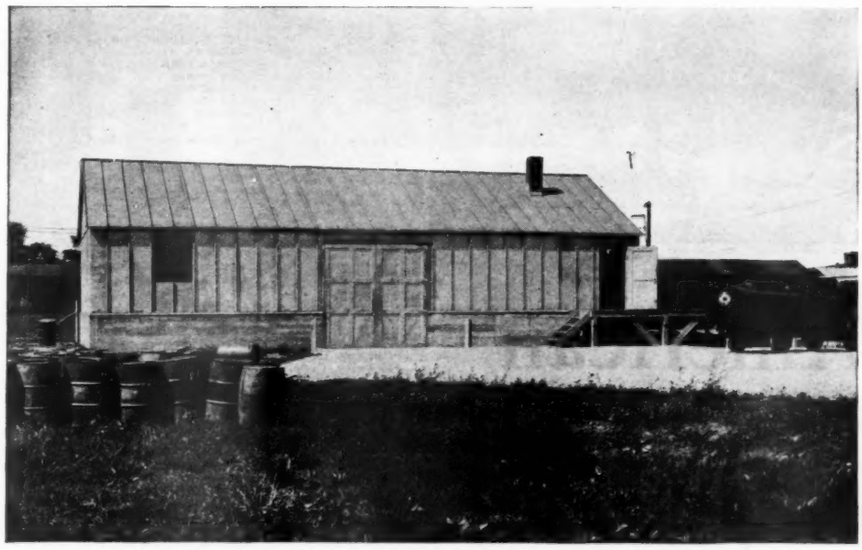
We are also Mid-Continent Distributors for the Shaffer Line of Tools and tools in general. The Olinda Type Casing and Tubing Head is available. The Shaffer Flow Bean has yet to find its equal in regulating production to meet production proration requirements.

You Get More From Atmore

ROBERT N. ATMORE COMPANY

FLUID PACKED PUMPS

Name and address—	No. of bbls.	M. ft. gas	Amount
*McDaniel, Geo. W., Tulsa	1,230.12	15,348	3,000.72
*McMahon Royalties Co., San Antonio, Tex.	1,601.67	70,593	2,446.35
*McClure, Carrie L., McAlester	.....	.....	7,131.63
*McAlester, Mary B., McAlester	.....	.....	7,131.63
*McDonald, Mrs. Francis, Chicago, Ill.	.....	.....	8,227.04
*McDaniel, W. F., Blackwell	.....	.....	2,934.41
*Moore, Dudley W., trustee, Tulsa	.....	.....	2,014.85
*McNorman, L. J., Seminole	.....	.....	5,456.35
N			
National Union Oil & Gas Co., Blackwell	4,326.68	.....	7,318.69
National Oil & Development Co., Tulsa	7,653.92	.....	9,092.50
National Refining Co., Cleveland, Ohio	8,242.69	24,647	14,405.45
Nowata Oil & Refining Co., Tulsa	.....	.....	10,068.02
North Central Texas Oil Co., Inc., New York, N. Y.	.....	.....	4,186.82
Northern Counties Gas Co., Ponca City	915.69	39,314	6,060.04
*North, R. B., Blackwell	.....	.....	2,451.36
*Norton, W. A., Amaret, Mo.	1,360.64	.....	2,045.87
Norris, W. C., Tulsa	.....	.....	12,717.71
Norwood Oil Co., Tulsa	8,308.35	.....	10,207.22
*Nester Oil Co., Alex	.....	.....	3,767.79
*Negahnquet, Stephen, Trousdale	.....	.....	5,374.92
*Neustadt, Walter R., Ardmore	1,833.14	.....	5,721.59
*New Royalty Co., Ponca City	2,878.65	.....	5,738.26
*New York Petroleum Royalty Corp., New York, N. Y.	31,066.12	.....	44,211.01
*Neal, Beulah, Wanette	.....	.....	3,301.74
*Nichols, G. A., Oklahoma City	.....	.....	2,254.00
*Nelson, F. M., New York, N. Y.	4,641.87	.....	5,794.99
Nelson, R. L., Webb City, Mo.	.....	.....	5,579.15
*Norvell, A. S., Wewoka	.....	.....	4,365.21
*Norvell, Ruby P., Wewoka	.....	.....	2,564.85
*Noble, Ira E., Ardmore	3,618.81	.....	4,525.40
*Noble, Hattie E., Ardmore	2,714.11	.....	3,394.02
New England Oil & Pipe Line Co., Boston, Mass.	30,704.36	.....	44,216.09
O			
*Oklahoma Royalty Co. of Canada, Toronto, Canada	.....	.....	77,177.42
Oklahoma Power & Water Co., Sand Springs	.....	168,333	16,833.30
Oklahoma Gas & Utilities Co., Chickasha	.....	.....	40,079.77
Oklahoma Natural Gas Co., Tulsa	.....	410,379	40,678.24
*Omega Oil Corp., Shreveport, La.	.....	.....	2,477.65
Ona Oil Co., Blackwell	.....	.....	22,519.86
*Oil & Gas Royalties, Inc., Toronto, Canada	.....	.....	2,842.33
Olean Petroleum Co., Bristow	.....	.....	10,294.79
Osage Gas Producing Co., Independence, Kans.	302.80	449,087	40,796.39
Osage Syndicate, Inc., Tulsa	3,635.82	.....	4,993.13
Osage Development Co., Bartlesville	4,524.93	.....	5,669.05
*Oil State Petroleum Co., Enid	7,744.65	.....	11,438.47
Oil State Petroleum Co., Enid	5,807.77	.....	9,980.37
*O'Dell, Mrs. Ollie B., Richmond, Calif.	.....	.....	17,000.83
*Oneal, J. M., Tecumseh	.....	.....	2,124.50
O'Rourke Oil Co., Bristow	.....	.....	11,643.54
*Osborn, W. B., Ada	.....	.....	2,859.17
Oglesby, estate of, Tulsa	.....	.....	5,309.53
*Oglesby, estate of, Tulsa	.....	.....	3,416.65
*Ohio Fuel Oil Co., Charleston, W. Va.	.....	.....	49,772.64
*Orwig, S. S., Wewoka	.....	.....	25,182.17
*Ogg, Kitty L., Muskogee	4,390.02	.....	6,406.56
Ogg Petroleum Co., Muskogee	12,371.27	.....	16,614.02
*Owen, Mary Severs, Muskogee	.....	.....	2,100.93
*Owens, O. O., Tulsa	.....	.....	4,014.66
*Oklahoma Gulf Royalty Corp., Tulsa	.....	.....	3,826.18
Ohio Osage Oil Co., Tulsa	.....	.....	6,618.72
P			
Pioneer Petroleum Co., Tulsa	13,161.34	.....	15,710.67
Pure Oil Co., Chicago, Ill.	.....	703,604	51,042.53
Pure Oil Co., Chicago, Ill.	.....	742,613	63,682.45
*Pure Oil Co., (suspense) Chicago, Ill.	.....	.....	453.15
Pure Oil Co., Chicago, Ill.	1,637,044.61	.....	2,406,343.83
Producers Oil Co., Tulsa	22,872.43	.....	34,972.61
Producers & Refiners Corp., Tulsa	111,670.22	.....	90,595.03
Producers & Refiners Corp., Tulsa	.....	Gas	11,662.26
Pierce Petroleum Corp., Sand Springs	23,250.70	.....	29,023.59
*Pierce Petroleum Corp., Sand Springs	43,659.64	.....	8,731.95
*Potts, Mable Dale, Yale	.....	.....	5,636.00
Pyramid Oil Co., Winchester, Ky.	6,257.16	.....	7,496.90
Plymouth Petroleum Co., Tulsa	10,068.89	.....	13,721.83
*Pharaoh, O. J., Henryetta	.....	.....	12,554.44
Pugh, M. W., Marlow	.....	.....	6,130.50
*Petroleum Rights Corp., New York, N. Y.	.....	.....	9,314.24
*Petroleum Royalties Co., Tulsa	.....	.....	128,046.44
Petroleum Co., The, and H. H. Mosier, Tulsa	11,237.37	34,291	16,168.47
Petroleum Co., Tulsa	4,891.72	5,978	6,828.92
Petroleum Producers Co., Wichita Falls, Tex.	.....	.....	25,058.04
Prairie Oil & Gas Co., Independence, Kans.	3,434,202.95	.....	5,046,350.02
Prairie Oil & Gas Co., Independence, Kans.	.....	498,693	41,541.47
Prairie Oil & Gas Co., Independence, Kans.	C.H. gas	3,650,292	328,170.82
*Phillips, Waite, Tulsa	2,551.78	.....	3,965.90
Phillips, W. G., and J. B. Milam, Chelsea	28,019.15	150	34,632.75
Phillips Petroleum Co., Bartlesville	805,700.37	.....	1,255,590.84
*Phillips, Rosa M., Davis	.....	.....	2,050.90
*Palmer, S. F., Okemah	.....	.....	7,672.49
*Pepper Oil & Gas Co., Oklahoma City	.....	.....	8,712.68
*Peniston, C. S., Ryan	10,748.89	.....	7,969.74
*Pryor, W. W., Holdenville	.....	.....	2,285.96
*Payne, Grace, Okmulgee	2,596.15	.....	4,845.96
*Priboth, Lillie M., Blackwell	2,294.41	.....	3,777.19
*Priboth, F. F., Blackwell	2,268.56	.....	3,744.96
*Pfile, Charles, Oklahoma City	.....	.....	2,752.66
*Panos, John, Wewoka	.....	.....	3,703.94
Priddy, W. M., estate, Wichita Falls	4,714.54	.....	6,887.54
Privett Drilling Co., Maramec	2,802.35	56,911	7,001.31
Pawnee Oil & Gas Co., Tulsa	3,947.02	.....	5,635.89
Paraffine Oil Co., Houston, Tex.	8,558.47	.....	10,203.41
Peters Petroleum Corp., Tulsa	85,513.09	104,997	121,439.53
Perkins & Cullum, Wichita Falls	13,626.21	.....	17,722.10
Pennok Oil Co., Tulsa	31,691.66	30,449	52,632.97
*Perpetual Royalty Corp., St. Louis, Mo.	.....	.....	7,294.93
*Peerless Oil & Gas Co., Indiana, Pa.	12,431.61	.....	19,679.12
Peerless Oil Producing Co., Tulsa	.....	.....	25,673.40
*Provident Royalty Corp., Tulsa	.....	.....	3,271.50
*Provident Royalties Corp., Tulsa	23,320.40	.....	34,623.19
Pine, W. B., Okmulgee	31,780.73	.....	46,967.41
Pine, W. B., and Phillips Petroleum Co., Okmulgee	36,022.84	.....	54,839.14
Pine, W. B., Okmulgee	27,075.96	.....	40,976.49
*Perpetual Royalty Income Co., Rock Island, Ill.	994.23	.....	2,128.25
Page, Charles, trustee, Tulsa	3,707.76	.....	5,620.72
*Patterson, J. A., Wewoka	.....	.....	5,168.64
Plains Petroleum Co., Inc., Tulsa	13,879.70	21,792	20,913.15
Panther Oil & Gas Co., Oklahoma City	2,039.70	.....	22,215.67
Papoose Oil Co. & E. H. Daly & J. A. Swindler, trustee, Tulsa	4,884.35	6,835	8,694.86
Papoose Oil Co., Tulsa	23,280.06	53,637	39,075.61
Paragon Oil Co., Tulsa	5,228.29	4,553	8,867.09
Pauline Oil & Gas Co., Oklahoma City	8,475.70	3,190	11,559.82
*Probst, George C., Tulsa	.....	.....	10,219.99
Q			
*Quail Oil & Gas Co., Oklahoma City	.....	.....	3,502.92
*Quimby, John, Montebello, Calif.	4,475.03	.....	6,546.90
Quinton Oil & Gas Co., Newkirk	.....	.....	8,035.29
Quinton Spelter Co., Quinton	.....	.....	9,774.61
Quinton Relief Oil & Gas Co., Quinton	.....	.....	8,192.23
R			
*Ralph, B. B., Kansas City, Mo.	.....	.....	5,314.24
Red Bank Oil Co., Tulsa	9,675.25	764	13,183.51
*Rockwell, J. A., Warren, Pa.	5,262.27	.....	8,273.82
Rockland Oil Co., Ardmore	29,683.98	.....	32,819.65
*Reed, Nellie, and B. H. Robertson, Nowata	.....	.....	2,575.26
*Reed, Frank H., Neosho, Mo.	.....	.....	37,380.93
*Reed, Frank H., Neosho, Mo.	.....	.....	4,744.50
*Reed, Isabelle S., Neosho, Mo.	.....	.....	4,744.49
*Reed, Isabelle S., Neosho, Mo.	22,558.47	.....	25,518.32
*Reed, Frank H., and Isabelle S. Reed, Neosho, Mo.	38,662.80	.....	56,730.07
*Reed, Eula Mae, Wewoka	.....	.....	9,546.13
Reserve Petroleum Co., Tulsa	20,934.25	.....	28,706.01
Reserve Petroleum Co., Tulsa	3,460.41	.....	5,338.91



Standard building made of Toncan Iron by the Marion (Ind.) Machine, Foundry & Supply Co. for the Standard Oil Co. of Indiana, Portland, Ind.

Fire and Rust Defied by Standard Building Made of Toncan Iron

THE use of standard, all-metal buildings is rapidly spreading in many lines of industry. Many companies find this type of construction the most economical to buy and the quickest to erect. The building illustrated here not only has these qualities, but by the use of rust-resisting Toncan Iron, long life and protection against fire hazards are also obtained.

Toncan Copper Mo-lyb-den-um Iron has demonstrated its superior rust and corrosion-resisting qualities in actual service and by laboratory tests. It is produced by a patented process developed by America's leading metallurgists. To pure iron in the molten state, copper and mo-lyb-den-um iron are scientifically added, resulting in an unprecedented resistance to rust and corrosion.

Toncan Iron has wide use, not only for standard buildings but for siding and roofing on various types of buildings. Its ability to outlast other metals makes it the most economical iron to use.

For further information get in touch with your nearest Toncan Iron dealer or write us.

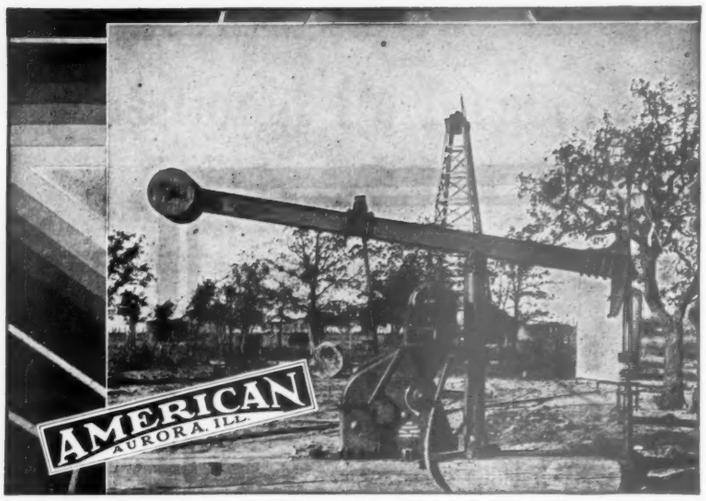
REG. U. S. PAT. OFF.
TONCAN
COPPER
Mo-lyb-den-um
IRON

Central Alloy Steel Corporation, Massillon, Ohio

Makers of Agathon Alloy Steels

Cleveland, Syracuse, San Francisco, Detroit, Philadelphia, Chicago, Los Angeles, New York, St. Louis, Seattle, Cincinnati

WORLD'S LARGEST AND MOST HIGHLY SPECIALIZED ALLOY STEEL PRODUCERS



The "American" Oil Well Pumping Jack!

The "American" Totally Enclosed Oil Well Pumping Jack has been designed in answer to the demand for the efficient pumping of individual wells.

American Jacks are made in four sizes—twelve inch to fifteen inch stroke, fifteen inch to eighteen inch stroke, eighteen inch to twenty-two inch stroke, and thirty inch to thirty-six inch stroke. All gears are totally enclosed and run in a bath of oil which floods the bearings, insuring smooth operation and long life. The head proper may be disengaged from the cable and swung back from the walking beam, permitting the rods to be pulled without moving the jack itself. There are no screw mechanisms or adjustments necessary. No gears are exposed.

Compact, sturdy and economical in operation! Ask for bulletin 181.

GENERAL OFFICES AND WORKS: AURORA, ILL.

The American Well Works

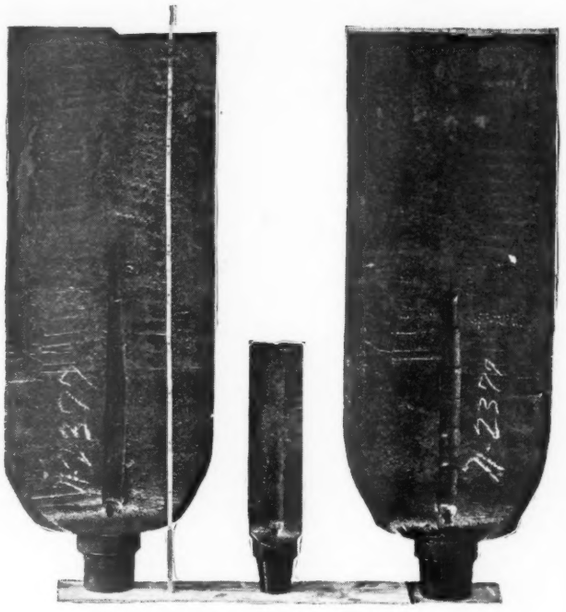
DISTRICT SALES AGENCIES:

Boston, Mass
Detroit, Mich.
Tulsa, Okla.
Denver, Colo.
St. Louis, Mo.
Salt Lake City, Utah
Vancouver, B. C., Canada
Omaha, Neb.
Birmingham, Ala.
Joplin, Mo.
Atlanta, Ga.
Dallas, Tex.
Charlotte, N. C.
Pittsburgh, Pa.
Roswell, N. Mex.
Portales, N. Mex.
Philadelphia, Pa.
Kansas City, Mo.
St. Paul, Minn.
San Francisco, Calif.
El Paso, Texas

BRANCH OFFICES:

Chicago, Ill., 1615 First National Bank Bldg.
New York, N. Y., Room 523—165 Broadway
Los Angeles, Cal., 420 E. Third St.

Name and address—	No. of bbls.	M. ft. gas	Amou
Reiter-Foster Oil Corp., Tulsa	159,482.95	.....	248,57
*Reiter-Foster Oil Corp., Tulsa	13,972.07	.....	20,15
*Richards, C. L., Tulsa	.....	.....	6,48
Robins, J. W., Fort Worth, Tex.	13,257.29	.....	13,42
*Robins, Horace, Moorestown, N. J.	.....	.....	3,15
Rex Oil & Gas Co., Winchester, Ky.	6,257.16	.....	7,49
*Rickey, L. D., Ardmore	2,166.26	.....	2,51
Regal Oil & Gas Co., Tulsa	7,479.42	2,781	10,25
*Rexroat, U. T., guardian, Ardmore	.....	.....	6,49
*Replogle & Johnston, Oklahoma City	.....	.....	5,65
*Replogle, Jamie, Oklahoma City	4,377.48	.....	6,88
*Replogle, D., Oklahoma City	.....	.....	5,93
*Royalty Investment Syndicate, New York City	.....	.....	3,21
Reynolds Oil & Royalty Co., Okmulgee	10,590.73	.....	15,98
*Reynolds Oil & Royalty Co., Okmulgee	2,649.68	.....	3,66
*Rena Royalty Co., Tulsa	7,370.88	.....	11,86
*Reagan, L. E., Tecumseh	.....	.....	4,36
*Ray, Joe, Chickasha	.....	.....	5,22
Ray, Joe, Chickasha	.....	.....	11,47
*Ray Oil Co., Alex	.....	.....	2,74
*Ramsey, Dock, Ripley	.....	.....	3,14
Ramsey, W. R. and W. E., Oklahoma City	63,381.23	.....	95,07
*Rainey, John W., Earlsboro	.....	.....	13,62
*Randall, W. S., Oklahoma City	6,423.27	.....	5,72
Roberts, Thomas C., Ardmore	.....	.....	6,89
*Roberts, Thomas C., Ardmore	.....	.....	2,00
*Rouse, Scott, Marshall	.....	.....	5,91
*Rowlett, B. H., Tecumseh	.....	.....	3,00
Roth, C. E., Independence, Kans.	4,677.02	.....	6,12
Rogers, Calloway, and Rosa Rogers, Earlsboro	.....	.....	41,55
Rogers, Leslie, Tulsa	6,519.05	.....	10,56
Rutz, Jake, Oil Co., Morris	.....	.....	8,06
*Russell, Dora E., Duncan	.....	.....	2,38
*Ross, George L., Marshall	.....	.....	4,30
Riverside Oil & Refining Co., Tulsa	22,359.99	.....	32,99
Riverland Co., Tulsa	15,886.27	10,395	23,33
*Riverland Co., Tulsa	2,568.26	1,009	3,56
Reliance Oil Co., Houston, Tex.	3,586.20	.....	4,12
Reliance Oil Co. of Oklahoma, Houston, Tex.	4,916.85	.....	10,29
*Robinson, Philo C., guardian, Los Angeles, Calif.	.....	.....	2,65
*Robinson, E. L., Tulsa	6,578.69	.....	9,58
Robinson, E. L., Tulsa	4,582.69	.....	6,09
Robinson, E. L., and Gibson-Zahnizer Oil Corp., Tulsa	4,443.53	4,500	6,82
Ryan Consolidated Petroleum Corp., Bartlesville	7,127.52	.....	10,22
Roxana Petroleum Corp., St. Louis, Mo.	1,262,678.53	.....	1,816,99
Roxana Petroleum Corp., St. Louis, Mo.	.....	1,699,433	110,08
*Roxana Petroleum Corp., St. Louis, Mo. (suspense)	.....	.....	13,85
*Royalty Corp. of America, Tulsa	.....	.....	53,42
S			
*Sparks, O. S., Ardmore	.....	.....	2,24
*Sullenberger, T. B., Dublin, Tex.	.....	.....	2,20
*Seay, Joseph M., Earlsbore	.....	.....	12,44
Swindler, James A., Muskogee	5,326.08	.....	6,96
Smith, Vivian O., Maud	5,839.36	.....	5,26
Skelly Oil Co., Tulsa	.....	904,724	61,35
Skelly Oil Co., Tulsa	709,343.71	.....	943,69
*Skelly Oil Co., Tulsa	2,952.40	.....	3,87
Sure Oil Co., Tulsa	3,650.09	5,554	5,12
*Sun Royalty Co., Tulsa	16,700.96	.....	24,29
Sunray Oil Co., Tulsa	13,133.02	.....	17,44
*Sturgeon, L. L., Wewoka	.....	.....	7,49
Superior Oil Corp., Tulsa	214,667.84	889,890	346,36
Sterling Oil & Gas Co., Abilene, Tex.	.....	.....	17,56
*Snell, Katie, nee Brown, Dustin	.....	.....	2,83
Silurian Oil Co., St. Louis, Mo.	100,990.58	.....	143,11
Snodgrass Oil Co., Frederick	.....	.....	9,72
*Seneca Royalties Co., Oklahoma City	1,591.54	.....	2,32
*Sneed Royalty Co., Tulsa	.....	.....	20,97
*Snyder, Charles A., Sapulpa	.....	.....	2,16
Sidwell Drilling Co., Sapulpa	.....	.....	6,77
*Slick, T. B., Oklahoma City	26,515.83	1,628,851	45,15
Slick, T. B., Oklahoma City	258,208.56	25,513,929	451,62
Slick, Tom, Inc., Oklahoma City	1,547,725.91	34,200,027	2,466,37
*Slick, Tom, Inc., Oklahoma City	15,894.80	881	22,88
*Smith, John, Wetumka	.....	.....	1,99
*Smith, N. Bert, Oklahoma City	.....	.....	4,45
Smith, G. J., Tulsa	.....	.....	13,34
*Smith, G. J., Tulsa	.....	.....	8,97
*Smith, Steve, Blackwell	.....	.....	3,44
*Smith, Leona, Blackwell	.....	.....	3,44
*Smith, Earl, Blackwell	.....	.....	3,44
*Smith, Mabel, Celina, Tex.	2,076.43	.....	2,97
Smith, Will H., Ardmore	4,266.63	678	5,08
Smith, C. R., estate of, Ardmore	3,091.64	2,388	3,80
*Smith, Charles R., Ardmore	5,299.80	1,655	6,47
Smith, Will H., trustee, Ardmore	11,324.63	5,529	13,53
Smith, Marie S., Ardmore	6,546.44	2,140	8,01
*Smith, Terry G., San Diego, Calif.	6,598.00	.....	9,49
Selby Oil & Gas, Tulsa	46,021.13	.....	45,01
*Selby Oil & Gas, Tulsa	2,144.21	.....	3,55
*Spring, Earl, Ryan	.....	.....	6,67
San Bois Gas Co., Quinton	.....	.....	11,12
Stanley, L. G., Pawhuska	.....	.....	7,69
*Standridge, John H., Lexington	.....	.....	3,42
*Strough, Arlie, and Alice, Davenport	.....	.....	2,96
*Sparks, Mrs. Harriett W., Earlsboro	.....	.....	6,69
*Sparks, Harriett W., Earlsboro	7,044.41	.....	10,27
*Sparks, L. O., administrator, Oklahoma City	17,675.83	.....	25,11
*Seay, Clyde W. D., Oscar	1,791.00	.....	2,95
*Shepherd, Dan, guardian, Shawnee	.....	.....	30,67
*Sulsberger, Dr. N., New York City	.....	.....	3,60
Sturm Drilling Co., Ardmore	22,219.70	.....	27,10
*Stone, M. R., trustee, Hawarden, Iowa	2,445.75	.....	2,18
*Shaum, B. E., trustee, Ripley	.....	.....	5,74
*Shimp, Ira, Blackwell	.....	.....	3,61
Sharp, Robert C., Tulsa	6,274.10	.....	9,03
Savoy Oil Co., Tulsa	9,664.60	7,857	11,90
Skelton-Moore Oil Co., Bartlesville	5,549.72	.....	7,15
Skelton, L. S., estate of, Okmulgee	.....	.....	5,69
Sinclair Oil & Gas Co., Tulsa	.....	Gas	188,95
Sinclair Oil & Gas Co., Tulsa	2,629,325.19	.....	3,998,12
*Sinclair, H. F., New York City	.....	.....	19,18
*Shonwald, Emanuel, Blackwell	.....	.....	2,13
*Shonwald, Dave, Blackwell	.....	.....	5,18
*Shonwald, Morris, Oklahoma City	.....	.....	5,53
Shertzer Brothers, Dewey	.....	.....	5,40
*Shirley, Gracie L., Tulsa	.....	.....	3,56
Sands Petroleum Co., Tulsa	46,778.71	291	67,33
*Summers, Mrs. George M., Tonkawa	.....	.....	3,00
Sampson Oil Co., Okmulgee	.....	.....	6,18
Simpson Fell Oil Co., Ardmore	42,419.64	3,613	49,04
*Simpson, W. E., St. Louis, Mo.	2,251.92	.....	3,29
*Simpson, A. O., Ardmore	2,261.92	.....	3,29
*Simpson, J. R., executor, Tulsa	.....	.....	12,56
Simms Oil Co., Dallas, Tex.	14,143.72	.....	20,42
*Sarasota Oil Co., Ardmore	3,891.87	.....	4,30
*State National Bank, Eufala	.....	.....	4,74
*Slough, E. D., Ardmore	.....	.....	2,75
*Surber, O. B., Chickasha	.....	.....	2,43
Snedden, George W., Tulsa	.....	.....	19,75
*Shields, W. J., Fort Worth, Tex.	.....	.....	6,99
Snowden & McSweeney Co., New York City	90,905.83	14,585	121,26
*Sykes, C. E., Ardmore	.....	.....	3,26
*Schumacher, Amanda, Orange, Calif.	.....	.....	2,08
*Shannon, L. O., Stillwater	.....	.....	3,02
*Schermerhorn, J. B., Inc., Minneapolis, Minn.	3,043.94	.....	3,96
Schermerhorn, J. B., Inc., Minneapolis, Minn.	71,874.45	.....	89,23
Schermerhorn Oil Co., Tulsa	4,743.05	255,922	25,30
Schermerhorn Ardmore Co., Minneapolis, Minn.	171,262.39	471	134,32
		C.H. gas 1,117	
*Schroeder, Walter, Enid	.....	.....	2,06
*Schroeder, Oscar, Enid	.....	.....	2,06
*Schroeder, M. H., Enid	.....	.....	2,06



Two 25"x60" Lucey Fishtail Bits. Smaller Bit is 6¾"x24".

FISHTAIL BITS

None Too Large Or Too Small For Lucey

Years of experimentation and constant research by Lucey metallurgists and engineers have produced an extraordinarily efficient alloy steel. This new steel, used in Lucey Fishtail Bits, has proved to be hard and tough enough to resist to a remarkable degree the severe stresses and wear and tear of heavy service. And yet it is easily dressed and tempered under average field conditions. Since its adoption for use in Lucey Fishtail Bits, not one record of a "twist off" on a Lucey Bit has been brought to our attention.

The quality of Lucey Fishtail Bits is always uniform. Each billet is carefully tested and analyzed, according to the standard method of A.S.T.M. Scientific and carefully supervised fabrication, forging, heat treating, and machining further assure a product conforming to Lucey standards.

Our Bulletin No. 130 tells the complete story of Lucey Fishtail Bits.

Forging Lucey Fishtail Bits

The Lucey Machine and Forge Shop is one of the largest and best equipped in the country. Every facility is provided for the scientific production of Lucey products. Illustration shows a step in the manufacture of a Lucey Fishtail Bit.

"WHEREVER THERE'S OIL" LUCEY REG. U.S. PAT. OFF.

LUCEY PRODUCTS CORPORATION

NEW YORK
3505 Woolworth Bldg.

LONDON
54 Old Broad St., E. C. 2

PARIS (Ier)
55 Rue de Rivoli

TULSA
224 E. Brady St.

HOUSTON
P. O. Box 609

HEALDTON, OKLA.

LOS ANGELES
5043 Santa Fe Ave.

SHREVEPORT
P. O. Box 116

DUNCAN, OKLA.

Distributors:

TULSA—International Supply Co.
HOUSTON—T. T. Word Supply Co.
FORT WORTH and WINK—Hercules Supply Co.
WICHITA FALLS—Bradford Supply Co.
WICHITA—Bridgeport Machine Co.
CASPER, WYO.—Champion Supply Co.
LOS ANGELES—Oil Well Equipment Corp.
PLOESTI, ROUMANIA
SAN FERNANDO, TRINIDAD, B. W. I.

"You Get the Best of It in Lucey Equipment"

LUCEY LUCEY LUCEY LUCEY LUCEY LUCEY LUCEY LUCEY LUCEY LUCEY

Donovan Boilers are Consistently Good

Donovan A.S.M.E. Code Oil Country Boiler

BIGGER and BETTER than ever

A large statement? Sure, but a fact, just the same.

The new DONOVAN 115 H.P. 250-lb. A.S.M.E. Code boilers are just that. Their outstanding features are as follows:

FIRST—Their size—much larger than usual. Larger even than some competitive sizes rated at 125 H.P. Our boiler is very conservatively rated so there is a large reserve of power.

SECOND—The longest firebox of any oil country boiler yet developed. This, together with the even tube layout makes the boiler a wonderfully easy steamer and economical on fuel.

THIRD—The large dome over the firebox providing all the dry steam any rig can use.

In addition to these, the various features for which DONOVAN boilers have always been known are retained or improved upon in this big boiler.

You can see these features at a glance and it will certainly pay you to look them over.

Manufactured by

DONOVAN BOILER WORKS, INC.

PARKERSBURG, W. VA.

NEW YORK OFFICE—30 Church Street
FRICK-REID SUPPLY CORPORATION
Mid-Continent and Eastern Distributors
GREAT NORTHERN TOOL & SUPPLY CO.
MIDLAND IRON WORKS
Montana Distributors

All Leading Supply Houses Throughout the Eastern Fields Handle

DONOVAN QUALITY PRODUCTS

NONE BETTER

Name and address—	No. of bbls.	M. ft. gas	Amount
•Schroeder, Paul, Enid	.....	.....	2,060.70
•Schroeder, Henry, Enid	.....	.....	2,060.70
•Schroeder, Caroline, Enid	.....	.....	2,060.70
•Schroeder, Hubert S., Los Angeles, Calif.	.....	.....	2,048.80
Sheridan Oil Co., Tulsa	17,011.49	12,596	23,555.18
•Scott, Mrs. Lucy B., Holdenville	.....	.....	2,705.34
Southwest Producing Co., Bristow	.....	163,132	12,970.60
•Shaffer, J. K. D., Oklahoma City	2,198.49	3,858	3,762.75
Shaffer, C. B., Chicago, Ill.	45,405.51	.....	52,006.12
Shaffer Oil & Refining Co., Tulsa	311,606.97	439,601	513,136.67
		C.H. gas 190,370	
•Shaffer Oil & Refining Co., Tulsa (suspense)	.....	.....	13,491.94
T			
•Taylor, A. H., Shawnee	.....	.....	5,169.10
•Taylor, Dr. Joseph C., New York City	.....	.....	5,982.60
•Taylor, H. H., Tulsa	.....	.....	62,382.61
Transcontinental Oil Co., Tulsa	118,735.99	201,454	183,430.00
Tidal Oil Co., Tulsa	.....	623,180	51,309.00
Tidal Oil Co., Tulsa	624,025.05	.....	849,310.94
Tidal Oil Co., partners, Tulsa	7,677.42	.....	9,113.91
•Tidal Oil Co., Tulsa	12,703.19	.....	15,773.73
Tidal Osage Oil Co., Tulsa	491,647.16	.....	713,938.15
Tidal Osage Oil Co., Tulsa	.....	217,069	20,237.75
•Tully, Martha Nadine, now Andrews, Muskogee	.....	.....	2,376.49
•Thompson, Bessie Clayton, Chicago, Ill.	1,479.51	.....	2,005.29
Texas Company, The, Tulsa	1,373,209.75	.....	1,884,303.54
Texas Company, The, Tulsa	.....	Gas	123,757.53
•Texas Company, The, Tulsa	10,884.22	.....	17,478.85
Texas Pacific Coal & Oil Co., Thurber, Tex.	47,093.73	7,989	39,142.42
•Thornton, David P., Muskogee	.....	.....	2,454.22
Thlocco Oil Co., Tulsa	10,605.29	.....	16,963.74
Turman Oil Co., Tulsa	4,795.38	890	6,252.06
•Tull, Vida M., Yale	.....	.....	12,706.67
•Templeton, M. E., Phoenix, Ariz.	.....	.....	29,844.26
•Towes, A. W., Crisfield, Md.	.....	.....	7,298.50
Thomas, J. Elmer, Fort Worth, Tex.	.....	.....	4,889.66
•Thompson, S. F., Okemah	.....	.....	3,129.06
Thompson Oil & Gas Co., Tulsa	3,940.48	989	5,452.61
•Tower Royalties, Inc., New York City	.....	.....	2,022.49
•Townsend, I. H., Shawnee	.....	.....	10,885.04
Gilbert, N. T., and Joseph Glass, receivers for Turman Oil Co., Tulsa	156,183.31	160,130	255,949.78
•Twin State Oil Co., Tulsa	20,937.65	.....	35,793.85
Twin State Oil Co., Tulsa	387,818.98	290,969	443,998.27
U			
•U. S. Royalties Corp., New York City	5,009.79	.....	6,931.81
U. S. Royalties Corp., New York City	4,344.79	.....	5,628.86
Urschel, C. F., Oklahoma City	4,147.58	183	7,476.02
Urschel, Mrs. Flored S., Oklahoma City	4,147.58	183	7,476.02
Umburn, W. L., Weleetka	.....	.....	25,615.98
Umburn, Gilla, Weleetka	.....	.....	7,807.58
United Eight Oil Trust, Madill	23,802.29	.....	32,930.43
•Umpleby, J. B., Oklahoma City	1,289.83	.....	2,049.46
•United Royalty Co., Newkirk	.....	.....	4,190.84
•United Producing Co., Inc., Charleston, W. Va.	1,449.01	.....	2,127.37
V			
Valley Osage Oil Co., Tulsa	18,485.06	.....	22,860.89
•Varnum, W. F., and Eliz. P., Shawnee	8,634.84	.....	12,704.49
•Vance, S. E., Tulsa	2,798.94	.....	4,759.50
•Vassar, Amanda, Tulsa	2,029.78	.....	3,461.10
•Vanseleous, W. H., Ponca City	1,164.96	.....	1,919.87
Vernon Oil & Gas Co., Blackwell	7,197.00	.....	11,459.59
Verland Oil & Gas Co., Perryman, Md.	.....	.....	12,667.42
Vogles, P. E., Pawhuska	.....	.....	7,692.87
•Vorhees, Leon G., Oklahoma City	.....	.....	26,647.45
•Viersen, Sam K., Okmulgee	7,339.13	.....	10,494.23
•Viersen Oil & Gas Co., Okmulgee	11,760.56	.....	17,274.03
W			
•Wood, Roy, Oklahoma City	.....	.....	10,084.85
•Whitaker, Charles, trustee, Eufala	.....	.....	3,122.84
•Winnett, J. W. G., trustee, London, Ontario, Canada	.....	.....	3,456.82
Wallace, J. E., Okmulgee	.....	.....	10,494.03
•Walker, C. C., Okemah	.....	.....	5,363.26
Wentz, L. H., Ponca City	158,933.53	187,003	255,844.61
White Eagle Oil & Refining Co., Wichita, Kans.	64,579.94	92,289	96,522.41
Wigton & Long Co., Okmulgee	.....	.....	5,065.10
•Wigton & Long Co., Okmulgee	.....	.....	1,625.13
Wiser Oil Co., Sistersville, W. Va.	88,123.12	.....	107,705.28
Winona Oil Co. of Delaware, Tulsa	40,717.77	.....	64,492.49
Wolverine Petroleum Corp., St. Louis, Mo.	185,049.99	.....	230,541.76
Wolverine Petroleum Corp., St. Louis, Mo.	.....	332,928	20,397.21
Winkler & McQueen, Oklahoma City	13,582.50	.....	17,538.73
Winemiller, John H., Corp., Tulsa	3,985.03	.....	5,323.50
Westheimer & Daub e, Ardmore	369,070.75	.....	544,668.90
•Westheimer & Daube, Ardmore	22,422.36	.....	27,159.84
•Western States Royalty Co., Great Falls, Mont.	4,786.48	.....	3,198.17
•Wright, Archie K., Muskogee	.....	.....	2,432.93
•Wright, Archie, Muskogee	.....	.....	2,132.14
Weeks, Margaret S., Ardmore	5,299.77	1,656	6,477.43
•Wilmott, John W., San Diego, Calif.	.....	.....	23,138.61
Wittmer Oil & Gas Properties, Pittsburgh, Pa.	6,430.15	10,282	10,888.38
•Wilson, Irvin L., Wewoka	.....	.....	9,078.09
•Wilson, Benton, Greenfield, Mo.	.....	.....	5,192.97
•Wilcox, Flossie E., Melrose Park, Ill.	.....	.....	2,671.40
Wilcox, H. F., Oil Co., Tulsa	270,915.12	.....	369,063.91
•Wilcox, W. S., Garber	.....	.....	1,996.58
•Welsh, J. L., Blackwell	.....	.....	3,216.99
•Welsh, Carrie B., Blackwell	.....	.....	2,466.68
Westervelt Oil & Gas Co., Oklahoma City	.....	52,154	5,215.50
•Westheimer, Max, Ardmore	.....	.....	4,596.19
Wellsville Oil Co., Wellsville, N. Y.	9,569.23	.....	12,012.70
Westerly Oil Co., Bartlesville	4,545.74	C.H. gas 2,999	6,683.84
Westland Oil Corp., Tulsa	34,477.44	14,121	50,212.07
•Washington Royalties Co., Bartlesville	.....	.....	9,384.49
Whitehill Oil Corp., Tulsa	5,718.17	.....	7,287.09
•Whitehill Oil Corp., Tulsa	1,409.88	.....	2,566.01
Whitehill Oil Corp., Tulsa	6,840.44	.....	8,724.47
•Woods, W. E., Cox	.....	.....	4,751.24
•Woodworth, W. W., Ringling	.....	.....	2,311.16
•Weber, Sophia, Marshall	.....	.....	3,404.88
•Wright, James, Bristow	.....	.....	5,183.06
•Wilson, Jesse May, Shawnee	.....	.....	2,671.40
Waggoner Petroleum Co., Ponca City	4,077.47	.....	6,719.52
Watchorn Oil Co., Oklahoma City	19,589.01	.....	25,857.49
•Whitney, E. W., Wewoka	.....	.....	60,175.18
•Work, W. K., Wewoka	.....	.....	7,331.91
•Work, E. P., Wewoka	.....	.....	7,331.91
Ward Oil & Gas Co., Tulsa	9,213.50	.....	12,054.66
•Ward, H. Z., Heavener	.....	.....	4,196.16
Walsh Oil Co., Tulsa	5,589.91	.....	6,962.37
•Ward, A. H., Wilson	3,730.75	.....	4,518.84
•Ward, B. F., executor, Wilson	1,709.44	.....	2,120.05
•Walker, E. A., Oklahoma City	.....	.....	49,669.81
•Wolcott, C. W., guardian, Cowets	.....	.....	3,400.68
Wallace, William L. and Lula E., Shawnee	.....	.....	5,092.65
•Watkins, J. W., Sulphur	.....	.....	3,296.30
•Waltman, J. L., Stillwater	.....	.....	3,488.88
Wright, J. H., estate, Sapulpa	15,275.92	.....	22,708.14
•Wren, T. H., Okemah	.....	.....	3,995.97
Wood Oil Co., Tulsa	.....	.....	12,224.66
•Wood, Horna, Tulsa	3,045.52	.....	4,854.91
Y			
•Youts, Harriett E., Shawnee	.....	.....	66,186.19
Young, L. W., Oklahoma City	.....	.....	7,921.01
York Petroleum Co., Muskogee	3,319.44	.....	5,928.49
Z			
Zimmerman, L. W., Chicago, Ill.	24,617.02	.....	27,824.09
•Zollars, Effie M., Lincoln, Ill.	.....	.....	2,231.45
Zola Oil Co., Tulsa	15,149.09	.....	18,670.31

NEW LOCATIONS IN TEXAS PANHANDLE AND NORTH AND WEST TEXAS FIELDS

TEXAS PANHANDLE

Carson County

Duncan & Reiger's No. 1 J. B. Hodges, 330 feet north and west of the SE cor. W half of NW, Section 112, Block 7, I&G.N. Survey. Skelly Oil Co.'s No. 10 H. Schafer, 330 feet north and 1,320 feet east of SW cor. N half Section 198, Block 3, I.&G.N. Survey.

Gray County

Magnolia Petroleum Co.'s No. 1 A. E. Gething, 330 feet north and west of SE cor. SW Section 14, Block A-9, H.&G.N. Survey. Parton & Holt's No. 1 A. E. Gething, 330 feet north and west of SE cor. NE Section 14, Block A-9, H.&G.N. Survey. The Texas Company's No. 7 G. H. Saunders, 990 feet north and 330 feet east of SW cor. W half of SE Section 4, Block 1, A.C.H.&B. Survey. Phillips Petroleum Co.'s No. 4 Johns, 330 feet south and west of NE cor. SE of SW Section 87, Block 3, I.&G.N. Survey.

Hutchinson County

Badger Oil Co.'s No. 3 Tom Lewis, 200 feet north and 250 feet east of SW cor. Section 18, Block L, E.L.&R.R. Survey. Phillips Petroleum Co.'s No. 1 Johnson Brothers-Dugan, 330 feet north and 990 feet west of SE cor. N half Section 72, Block 46, H.&T.C. Survey. Same company's No. 1 J. M. Sanford-Andorf, 330 feet north and west of SE cor. of the north 80 acres of Section 80, Block 46, H&T.C. Survey.

NORTH CENTRAL AND WEST TEXAS

Brown County

Milham Corp.'s No. 8 W. W. Rosser, 1250 feet north and 850 feet east SW cor. of lease out of the W. Q. Cross Survey. Phillips Petroleum Co.'s No. 17 Roy Hickman, 450 feet north and 750 feet west SE cor. of lease out of the Thomas Benson Survey No. 783. Pitts and others' No. 1 J. E. Harrell, 150 feet south and west NE cor. of the south 84 acres Section 2, Comal County School Land No 181. Young Brothers, Alexander & Woodley Petroleum Co.'s No. 16 Roy Hickman, 406 feet north and 637 feet east SW cor. of 80-acre lease out of the Thomas Benson Survey No. 783.

Archer County

Atlantic Oil Producing Co.'s No. 1 J. D. Lyles, 450 feet south and 150 feet east of the NW cor. of NE NE Section 7, Hooper & Wade Survey A-234. Continental Oil Co.'s No 1 J. E. Parrish-A Parrish, 150 feet south and west of NE cor. north 20 acres of the west 40 acres of the south 220 acres S half Section 2, S.P.R.R. Survey A-1,004. Harry Hines' No. 1 L. F. Wilson, Section 31, 150 feet north and west of the most southerly SE cor. Lot 12, Section 31, A.T.N.C.L. Survey.

J. H. Johnson and others' No. 1 A. P. Jackson Estate, 150 feet north and east SW cor. N half Lot 73, W. B. Aldridge Survey A-2. Panhandle Refining Co.'s No. 1 J. H. White, 150 feet north and 870 feet east of SW cor. S half Lot 5, Section 42, A.T.N.C.L. Survey. American Refining Co. and Corlett & White's No. 3 J. F. Cernosek, 150 feet north and west SE cor. of their 40-acre lease out of Section 2,409, T.E.&L. Survey.

Consolidated Oil Co.'s No. 4 W. F. Neimeyer, 750 feet north and 150 feet east SW cor. north 40 acres of the south 123.4 acres of the W. F. Neimeyer 160-acre tract Section 2,415, T.E.&L. Survey. C. W. Gilliland's No. 9 W. F. Neimeyer, 450 feet south and east NW cor. of 80-acre lease out of Section 2,415 T.E.&L. Survey. R. Q. Jones and others' No. 1 W. L. Andrews, 150 feet south and 450 feet east of NW cor. of the north 30 acres of the west 40 acres SW Section 2,803, T.E.&L. Survey.

William Moore's No. 1 H. L. & J. F. Ward, 150 feet south and east of NW cor. T. L. Cason Survey A-1,170. Mount-Ray & Simms Petroleum Co.'s No. 1 Abercrombie & Taylor, 550 feet north and 150 feet east SW cor. of the south 54 acres of the east 94 acres Section 81, Club Ranch Subdivision. F. P. Rose's No. 1 J. R. Parkey, 150 feet south and west NE cor. of the west 30 acres of the east 60 acres of the south 80 acres Lot 39, J. R. Parkey Subdivision, Dallas County School Land, A-113.

Shappell Oil Co.'s No. 13 R. O. Prideaux, 150 feet south and 750 feet west NE cor. south 200 acres of the north 313 acres J. I. Hand Survey, A-181. The Texas Company's No. 9 W. O. Hayter, 750 feet north and 450 feet west SE cor. of 120-acre lease out of Section 2,409, T.E.&L. Survey. Same company's No. 10 W. O. Hayter, 1,050 feet north and 450 feet west SE cor. of 120-acre lease out of Section 2,409 T.E.&L. Survey.

Callahan County

Grass Roots Oil Co.'s No. 5 C. W. Klutts, 450 feet south of NE cor. E line Section 44, Comal County School Land. Moutray Oil Co.'s No. 2 P. G. Hatchett, 468 feet south and 155 feet west NE cor. NW NW Section 29, Deaf & Dumb Asylum Land. Same company's No. 3 P. G. Hatchett, 150 feet south and 510 feet west NE cor. NW NW Section 29, Deaf & Dumb Asylum Land. Prairie Oil & Gas Co.'s No. 1 W. A. Gilliland, 128 feet north and 150 feet west SE cor. of the west 50 acres of the W. A. Gilliland 100-acre tract out of the G. M. Vigal Survey No. 798, A-523.

The Texas Company's No. 1 W. A. Bush, 2,400 feet south and 1,972 feet west NW cor. W. A. Boren Survey and located in the C.T.&M.C. Survey No. 2. The Texas Company's No. 5 P. G. Hatchett, 467 feet south and 200 feet east NW cor. NE NW Section 29, Deaf & Dumb Asylum Land. Same company's No. 6 P. G. Hatchett, 150 feet south and 450 feet east NW cor. NE NW Section 29, Deaf & Dumb Asylum Land.

Clay County

Lone Star Gas Co.'s No. 21 J. D. Stine Estate, 150 feet south and west NE cor. Section 17, Parker County School Land, A-374.

Coleman County

Levi Smith's No. 2 T. B. Hill-A, 450 feet south and 811 feet west NE cor. of the T. B. Hill 180-acre tract out of the S. Sprague Survey No. 664. Texas American Syndicate's No. 2 Mrs. N. D. Newton, 3,150 feet south and 6,700 feet east NW cor. of the San Augustine University Survey No. 519. Dunnigan & McCready's No. 3 M. B. Rice, 1,800 feet north and 1,969 feet east SW cor. of the M. B. Rice 507-acre tract out of the Bonds & Sanders Survey No. 91. C. R. Trexel's No. 1 J. W. Wells, 150 feet south and west NE cor. W half Lot 4 out of S half M. Martinez Survey No. 751.

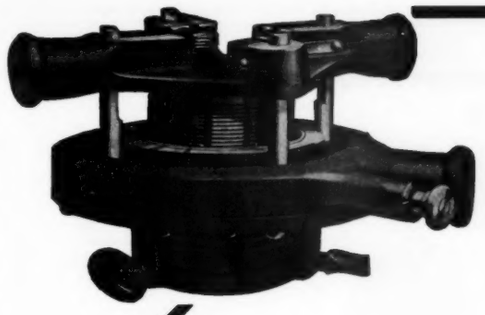
Eastland County

Arkansas Fuel Oil Co.'s No. 12 C. U. Connellee, 975 feet north and 150 feet west SE cor. W 500 acres N. Ussury Survey.

Howard County

Cosden & Co.'s No. 2 Dora Roberts-D, 1,650 feet south and 990 feet west NE cor. Section 157, Block 29, W.&N.W.R.R. Survey. Dunnigan & Hyer's No. 3 H. R. Clay, 785 feet north and 250 feet east SW cor. Section 126, Block 29, W.&N.W. R.R. Survey. F.H.E. Oil Co. and others' No. 8 Dora Roberts-B, 2,310 feet south and east of the NW cor. of Section 137, Block 29, W.&N.W.R.R. Same company's No. 9 Dora Roberts-B, 1,040 feet south and 2,310 feet east of the NW cor. of Section 137, Block 29, W.&N.W.R.R. Same company's No. 10 Dora Roberts-B, 330 feet south and 210 feet east of the NW cor. of Section 137, Block 29, W.& N.W.R.R. Same company's No. 11 Dora Roberts-B, 1,700 feet south and 2,310 feet east of the NW cor. of Section 137, Block 29, W.&N.W.R.R. Same company's No. 6 Dora Roberts-D, 2,310 feet south and 990 feet east of the NW cor. of Section 136, Block 29, W.&N.W.R.R.

Green Oil & Refining Co.'s No. 4 H. R. Clay, 785 feet north and 250 feet west of the SE cor. of Section 127, Block 29, W.&N.W.R.R. Marland Production Co.'s No. 11 H. R. Clay-A, 250 feet south and



"TOLEDOS"—
Always Dependable

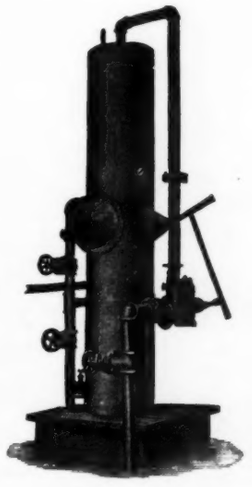
TRADE-MARK

"TOLEDOS" never fail to perform their work of cutting and threading all sizes of pipe up to 12" easily, quickly and efficiently.

Oil field operators know from experience that when results are demanded, genuine "TOLEDO" trademarked tools will be specified. Our complete catalog will be gladly sent you on request.

THE TOLEDO PIPE THREADING MACHINE CO.
TOLEDO, OHIO
New York Office
72 Lafayette St.

THE NAME TRUMBLE HAS LONG BEEN



associated with oil and gas separation. It was the pioneer device in the field and the new improved Trumbles stand in the front rank today.

Let us solve your separation problems.

TRUMBLE GAS TRAP COMPANY
756 SUBWAY TERMINAL BUILDING
LOS ANGELES, CALIFORNIA

TULSA
C. F. Camp, 221 E. Archer Street

ALBERTA, MONTANA AND WYOMING
Great Northern Tool & Supply Co., Billings, Montana

Venezuelan Representative:
Johnson and Schnitter
Apartado 324,
Maracaibo, Venezuela

Power Piping
FOR EVERY OIL FIELD NEED

OF the many ramifications of this company's service to the oil industry, no feature has better proved our fitness in the field than the special welded work we are called upon to produce.

Headers, manifolds, fittings, pipe of all varieties —welded and fabricated to the most exacting specifications. Prompt and economical, too!

POWER PIPING CO.
PITTSBURGH, PA.

Diamond Drill Brings in Cheapest Wildcat Well in Venezuela

Sullivan Diamond Drills have gained recognition from the big oil companies as premier equipment for locating oil. But frequently these machines also prove most economical for production drilling—due to their ability to bore hard or soft material as encountered, to cut hard rock quickly, and to start a deep hole with a diameter not much larger than the finishing one. And in the Turner Valley Field Diamond Drills are the only means of drilling wells against the terrific gas pressure.

A recent dispatch from Venezuela says a Sullivan "P-2" has just brought in the cheapest wildcat test well in that country. From the spudding-in to the finish at 4,350 feet, only 5 months and 9 days elapsed, 47 days of which were lost due to a flood, and to cementing and testing. The actual drilling was done in 2½ months.

At 1,956 feet, 8¼-in. casing was set—at 3,051 feet, 6¼-in.—and at 3,467 feet, 4¾-in. A 4¼-in. hole was bored, and core taken from this point down to 4,350 feet, where oil was struck. The same company is now drilling a second well with this Sullivan Diamond Drill, and have set 170 feet of 16¾-in. casing, and 1,006 feet of 11¾-in.

Would you like the free 80-page handbook "Diamond Drilling for Oil?"

Use the Coupon

SULLIVAN DIAMOND DRILLS

Send me free 80-page handbook "Diamond Drilling for Oil."

Name .....
Address .....
Occupation .....

SULLIVAN
Sullivan Machinery Company
88 E. Adams St., CHICAGO

2,890 feet west of the NE cor. of Section 139, Block 29, W.&N.W.R.R.

Jack County

E. W. Walton and others' No. 1 W. D. Moore, 150 feet north and east of the SW cor. of the north 145 acres of the W. D. Moore 295-acre tract out of Section 2, S.P.R.R., A-1,675. Same company's No. 1 Mrs. J. W. Maxey, 150 feet north and 220 feet west of the SE cor. of the E half of the NE of Section 1, S.P.R.R., A-568.

A. Ratblatt and others' No. 1 Mrs. J. W. Maxey, 150 feet north and west of the SE cor. of the W half of the Mrs. J. W. Maxey 80-acre tract out of Section 2, S.P.R.R., A-1,736. Osage Oil Corp. and Vacuum Oil Co.'s No. 1-A R. R. Clayton estate, 2,313 feet north and 2,819 feet west of the most southerly SE cor. of the Lewis Knight Survey, A-324. C. Lydecker's No. 1 J. P. McCoy, 150 feet south and 600 feet east of the NW cor. of the John W. Hale Survey, A-285.

Pecos County

McCarty Oil Co.'s No. 1 E. W. Bennett, 960 feet south and east of the NW cor. of Section 592, G.C.&S.F., A-5,262. California Co.'s No. 1 M. A. Smith, Lease 1, Section 21, 990 feet south and 1,005 feet east of the NW cor. of Section 21, Block 194, G.C.&S.F. Survey. Same company's No. 5 M. A. Smith, Lease 1, Section 23, 2,668 feet north and 1,355 feet west of the SE cor. of Section 23, Block 194, G.C.&S.F. Same company's No. 6 M. A. Smith, Lease 1, Section 23, 990 feet north and 1,136 feet west of the SE cor. of Sectiton 23, Block 194, G.C.&S.F.

Reeves County

D. P. Davis and others' No. 1 A. A. Kinney and others, 330 feet south and 200 feet west of the NE cor. of the S half of the NW of Section 26, Block C-18, T.&P.

Shackelford County

The Texas Company's No. 2 J. F. Sedwick, 1,110 feet north and 3,700 feet east of the SW cor. of the J. F. Sedwick 288-acre tract out of Section 1, Block 10, E.T.R.R. Same company's No. 3 J. F. Sedwick, 750 feet north and 3,800 feet east of the SW cor. of the J. F. Sedwick 288-acre tract out of Section 1, Block 10, E.T.R.R. Same company's No. 4 J. F. Sedwick, 1,110 feet north and 3,300 feet east of the SW cor. of the J. F. Sedwick 288-acre tract out of Section 1, Block 10, E.T.R.R. Same company's No. 5 J. F. Sedwick, 1,500 feet north and 3,300 feet east of the SW cor. of the J. F. Sedwick 288-acre tract out of Section 1, Block 10, E.T.R.R.

Throckmorton County

C. B. Martin and others' No. 1 W. B. Fant, 150 feet north and east of the SW cor. of Section 947, T.E.&L.

Wichita County

H. Hines and Humble Oil & Refining Co.'s No. 11 J. L. & T. J. Waggoner, 242 feet south and 1,430 feet east of NW cor., Lot 2, Section 2, G.C.&S.F. Survey, A-772. H. Hines and others' No. 1 William Guthrie, 1,907 feet south and 150 feet west of NE cor., Section 24, Block 7, H.&T.C. Survey. Cooper & Mishler's No. 14 J. L. & T. J. Waggoner, 750 feet north and 150 feet west of SE cor. of Lot 14, Section 2, G.C.& S.F. Survey, A-772. United Producers Co.'s No. 4 W. L. Hodges, 200 feet north and 1,050 feet west of SE cor. of the W. L. Hodges 214-acre tract out of H.T. &B. Survey No. 1, A-139.

Comac Oil Co. and Prairie Oil & Gas Co.'s No. 1 M. P. Bishop, 1,365 feet north and 450 feet west of SE cor. of M. P. Bishop tract out of L. Neatherly Survey, A-240. Coleman & Coppock's No. 17 Kemp & Kempner, 150 feet south and east of NW cor. of 26.66-acre lease out of Block 82, Kemp Wichita Valley Land. American Refining Co.'s No. 1 fee, 1,470 feet south and 450 feet east of NW cor. of 282.7-acre tract(shown as J. E. Terhune) out of the J. M. Sharp Survey, A-262.

Wilbarger County

Phillips Petroleum Co.'s No. 1 W. T. Waggoner-Jennings, 600 feet north and 200 feet east of SW cor. SE SE, Section 1, Block 17, H.&T.C.R.R. Survey. Robertson and others' No. 2 W. T. Waggoner, 150 feet north and 3,510 feet west of NW cor., Section 5, Block 3, H.&T.C. Survey, and located in Thomas D. Purnell Survey. Derby Oil Co.'s No. 1 W. T. Waggoner-C, 1,158 feet north and 150 feet east of NW cor., Section 4, Block 5, H.&T.C. Survey, and located in Section 2, C.T.&M.C. Survey. Cosden & Co.'s No. 1 W. T. Waggoner-D, 450 feet south and 150 feet west of NE cor. SE NE, Section 35, Block 2, H.&T.C. Survey.

Winkler County

Prairie Oil & Gas Co.'s No. 2 J. B. Leck, 330 feet south and 2,310 feet west of NE cor., Section 16, Block 74, School Land. Roxana Petroleum Corp. and The Texas Company's No. 6 E. W. Cowden-A, 1,320 feet south and 990 feet east of NW cor., Section 3, Block B-12, School Land. Roxana Petroleum Corp. and others' No. 2 Lum Daugherty, 2,310 feet south and 1,650 feet west of NE cor., Section 3, Block 74, School Land. Skelly Oil Co.'s No. 1 T. G. Hendricks-C, 2,145 feet north and 2,310 feet west of SE cor., Section 10, Block B-12, School Land.

Young County

Allday Oil Corp. and Carter's No. 7 C. W. Johnson-A, 450 feet south and 750 feet west of NE cor. of Lot 14, Edward W. Sergeant Survey, A-253. J. Bundy and others' No. 1 J. R. Bryan and others, 150 feet east of NW cor. of south 50 acres of east 140 acres of Section 1,902, T.E.&L. Survey.

W. P. Chancellor and others' No. 1 T. L. Oliver, 600 feet south and 450 feet east of NW cor. E half, Section 1,492, T.E.&L. Survey. Holbrook & Woods' No. 2 J. W. Davis, 437 feet north and 150 feet east of SW cor. of E half of west 60 acres of S half of Section 1,395, T.E.&L. Survey.

Prairie Oil & Gas Co.'s No. 1 A. A. Bernhardt, 500 feet north and 800 feet east of SW cor., Section 238, T.E.&L. Survey. Petroleum Producers Co.'s No. 3 L. Parrish-A, 450 feet north and 750 feet east of SW cor., Section 409, T.E. &L. Survey. Same company's No. 7 W. H. Hennig, 750 feet south and 450 feet east of NW cor., Section 410, T.E.&L. Survey. Mook-Texas Oil Co.'s No. 10 J. H. Davis, 743 feet south and west of NE cor. of S half of Section 1,487, T.E.&L. Survey. F. W. Kennedy and others' No. 5 C. W. Johnson, 750 feet north and 1,050 feet west of SE cor. of Lot 11, W. Sergeant Survey, A-253.

Humble Oil & Refining Co. and D. F. Pruitt's No. 1 R. E. Hill, 85 feet north and 1,573 feet east of SW cor., Section 195, T.E.&L. Survey. E. R. Riggs and others' No. 19 J. B. McKinley, 450 feet south and 1,050 feet east of NW cor., Section 1,489, T.E.&L. Survey. E. R. Riggs and others' No. 4 O. L. Sweet, 450 feet south and 1,500 feet west of NE cor., Section 1,488, T.E.&L. Survey. D. L. Wolfe and others' No. 7 J. T. Lowe, 150 feet south and east of NW cor. of south 40 acres of north 80 acres of W half of Section 59, T.E.&L. Survey. Wise & Jackson and others' No. 1 R. J. Calvin, 150 feet south and 1,150 feet east of NW cor. of R. J. Calvin 200-acre tract out of A. Rohus Survey, A-240.

Corrected Locations

Brown County: Young Brothers, Alexander & Woodley Petroleum Co.'s No. 15 Roy Hickman, 425 feet north and 300 feet west of SE cor. of 80-acre lease out of the Thomas Benson Survey No. 782.

Coleman County: Humphrey Brothers and others' No. 3 J. P. Matthews, 2,858 feet north and 150 feet east of SW cor. of C. Raquet Survey No. 43. Magnolia Petroleum Co.'s No. 22 J. P. Morris, 750 feet south and 600 feet west of NE cor. of Charles Shepherd Survey No. 727. Morrison & St. John's No. 1 L. V. Eddington, 970 feet north and 2,311 feet east of SW cor. of Victoria County School Land No. 187.

Haskell County: V. Ziegler and others' No. 1 A. C. Pierson, 200 feet north and 2,640 feet west of SE cor. of W. Taylor Survey No. 27, A-392.

Throckmorton County: E. J. McCurdy and others' No. 3 Reynolds Cattle Co., 610 feet south and 1,180 feet west of NE cor. SE, Section 19, Block 2, A.B.& M. Survey.

Wilbarger County: Phillips Petro-

Drilling Just For a Hole—

?

What About You?

Drill a hole without hopes of oil? "Hardly!" Take a chance on weak pipe and casing? "Well, maybe I do do that sometimes. I ***think*** it's cheaper."

OR FOR

This Man *Knows*

Over in Tulsa a few weeks ago we talked with a man who had just lost a promising hole—casing failed. His next job—and the next, and the next, and the next—all are going down with *Pittsburgh Seamless* drill pipe and *Pittsburgh Seamless* casing. He ***knows*** it's cheaper.

That ⅓ Extra Strength is Why Pittsburgh Seamless is Safe

No Welded Pipe Weaknesses

Pittsburgh Steel Products Co.
DIVISION OF
Pittsburgh Steel Co.

PITTSBURGH NEW YORK DETROIT CHICAGO HOUSTON TULSA

Pacific Coast Distributors: Buck & Stoddard, Los Angeles, Calif.

The big idea in pump valves

for oil, gasoline, benzine, naphtha, hot water—

BELMONT 1502

Lighter than rubber, unbreakable under most severe service, and absolutely unaffected by oil or any of its derivatives, the "BELMONT 1502" pump valve has everything to commend it for oil field and refinery use.

The "BELMONT 1502" pump valve is built up of laminated fabric bound by a special compound. It cannot disintegrate, nor drop particles into the flow to clog pumps and valves. It can be stocked for an indefinite period without deterioration.

For an absolutely tight seat at all times, specify "BELMONT 1502."

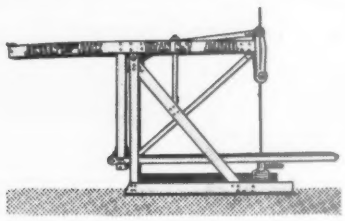
Write us for details.

BELMONT PACKING & RUBBER CO.
PHILADELPHIA

Agencies in all principal cities.

NEW YORK
99 Chambers St.

CHICAGO
Harris Trust Bldg.



Jack Facts

EVEN a very splendid suit of clothes is a mighty poor investment if it doesn't fit. Same way with Pumping Jacks. If a jack doesn't fit the well, it's a poor investment. That's why we are proud of our ability to give you an easy-running Jensen Jack with any stroke, any strength—a jack that FITS THE WELL. You tell us about your wells and we'll tell you about a Jack that will serve your purpose to better advantage than any other Jack built today. Catalog on request. (Electric units, too.)

Jensen Bros. Mfg. Co.

COFFEYVILLE, KAN.

Export Office: 136 Liberty St., N. Y.

leum Co.'s No. 2 W. T. Waggoner-MM, 200 feet north and 180 feet east of SW cor. NW NE, Section 30, Block 4, H. &T.C. Survey.

FOREIGN TREND IN NEW MOTOR FUELS

(Continued from Page 148)

engine with gas under pressure raises certain interesting questions.

According to the work that is expected of it, the engine is given a variable quantity of a mixture which should theoretically always contain a constant proportion of gas and air; but to obtain this result it is not sufficient to vary the sections of the air and gas inlets to the mixer parallel to one another. The expander, in fact, always allows the same quantity of gas to leave the cylinder in a unit of time; under these conditions pressure on the accelerator only increases the inrush of air, and the mixture consequently grows poorer as the speed of the engine increases. Acceleration is, therefore, fairly difficult to obtain under these conditions. To succeed in this an excess of gas must systematically be maintained at low and medium speeds thereby reducing the efficiency of the engine.

Gas as fuel therefore appears, in the present state of things, to be suitable for cars for town use and in general for all vehicles of a low stroke capacity minute which return frequently to their source of supplies. The most suitable gaseous fuels are town gas and methane.

Town Gas

The gas companies are now preoccupied with the fact that sales which have hitherto increased year by year have a tendency to fall off. The sale of gas compressed in light cylinders would, therefore, assure a very appreciable outlet for this industry. Most gas works could be equipped with the relatively inexpensive plant required for compressing gas into the cylinders; numerous service stations would thus be formed from whence motorists could easily obtain supplies. This alone would do much to generalize the use of gas for this purpose.

Methane

Town gas only has a calorific power of 5,000 calories per cubic meter; the substitution of a richer gas in the cylinders would be equivalent, all other things being equal, to increasing the capacity of the cylinder and finally the radius of action of the vehicle. Methane (CH^4), a naturated carbide containing 10,000 calories per cubic meter, seems to be the most suited.

Methane is obtained:

a. From natural sources (Vaux-en-Bugey-Amberieu) where 85 per cent of the gas collected is methane.

b. From the gases given off when coke is burnt at a high temperature.

c. From catalytic synthesis starting from water gas ($CO+H$):

$$CO+3\,H^2—CH^4+H^2O$$

under certain conditions of temperature and pressure and in the presence of catalysers.

Nascent Acetylene

The use of acetylene gas (C^2H^2) as a fuel for engines is not an innovation. Quite recently two cars entered for the National Fuels Competition utilized this fuel and both successfully covered the prescribed distance.

A generator carried on the car supplied the necessary gas which was produced by the action of water on calcium carbide.

$$C^2\,Ca+H^2O=C^2\,H^2+Ca\,O$$

The generator was connected to the engine by a flexible pipe.

As the mixture of air and acetylene has a lower flash point than the mixture of air and gasoline, it should, therefore, detonate spontaneously under the influence of a rise in temperature due to the compression if it is utilized in a gasoline engine which has not been modified; this is the phenomenon of preignition whose effects are always disastrous.

The wave of combustion moves through the mixture of acetylene and air at a very high speed; this rapid combustion is in reality a vertiable shattering explosion which greatly fatigues the engine. Two methods can be employed to prevent these shattering effects, viz., the engine can be underfed by choking the admission or an antidetonator, e.g., water in the vesicular state, could be introduced into the gaseous charge. In both cases the efficiency of the engine will be low; further, serious difficulties are experienced in dosing the acetylene and in stirring it up in the mixture.

These disadvantages would be completely eliminated in an engine specially designed to use acetylene as a fuel. The chief characteristic of this engine would be its low ratio of compression. The gas produced must be thoroughly purified and freed from the particles of pulverulent lime carried over which would obstruct the valves and exercise a detrimental effect on the lubricating oils in time.

Even for an engine of small stroke capacity minute, the generator is heavy and cumbersome owing to the enormous quantity of water and carbide it is necessary to carry. Further, whatever may be this quantity, frequent supplies must be obtained en route, hence fatigue and time lost for the user; as a matter of fact, in practice, several times its weight of water must be added to the carbide.

The cars entered for the National Fuels Competition had to obtain fresh supplies of carbide at the end of 15 kilometers and of water at the end of 40 kilometers. Producer gas is gas obtained by incomplete combustion in apparatus called a producer. It is quite possible to run an engine on producer gas. For many years past, numerous fixed engines have used producer gas, but the producer plant is this case is heavy and cumbersome. The first step towards the use of producer gas in motor car engines, therefore, consists in designing producers sufficiently compact and light to be permanently fixed on the vehicles which are to run on the gas.

It can here be stated a saving of as much as 70 per cent can be effected by using producer gas in the place of gasoline but while certain road tests have been hailed as successes no general use of producer gas has occurred.

LIFTING PETROLEUM IN ATOMIZED FORM

(Continued from Page 148)

ditioned by the weight of the particles it is required to carry. If the velocity is increased the equilibrium state also is increases, and with it the delivery, which preferably in the case of oil, should be in a vertical plane. The latest forms of atomizer for liquids used in industry, such as for lacquering and painting large surfaces, form very tiny droplets and require a pressure of from one to three atmospheres. Thus no several stage compressor plant is necessary, and about double the calculated theoretical power suffices to lift the oil. As the atomizer discharges the oil particle, in the form of a cone, the lifting gas has also the task of further separating and distributing the oil particles. But the whole of the work required can be performed by a one-stage compressor with an intake of three cubic meters per minute and delivering gas or air under pressure of three to five atmospheres, and the power required is from 10 to 18 horsepower. The compressor can be operated by the use of a gas motor in which the cheap well gas will be used, thus making the method the cheapest of all oil-raising methods and dispensing with heavy moving parts.

The atomizer is fixed near the bottom of the well at the end of the delivery pipe. As this device provides only for the atomizing of the oil, two or three open nozzles must be provided in the lower end of the delivery pipe through which the gas for lifting the oil is passed, as the gas accompanying the atomized oil is not sufficient in itself to perform the whole duty. The surface of the oil in the well can either be under pressure or partial vacuum, but there is some difference of opinion among operators whether pressure or vacuum is the more advantageous. However, either can be provided in a simple manner. The diameter of the deliver

pipe depends upon the delivery speed and the quantity of oil to be raised. If the oil carries sand in suspension a greater velocity of the gas stream is necessary. With paraffin oils no separation of the wax occurs, because the relatively small compression of the lifting gas or air results in too little expansion of the oil-gas mixture to appreciably lower the temperature. In raising the oil from a deep shaft there is a tendency for some of the oil particles to coalesce into large drops not easily carried in the gas stream. To meet this condition, oil-collecting rings are provided in the interior of the delivery pipe at distances apart of 200 or 300 meters, which receive these large drops and by means of tiny outlets break them up again into small particles, which pass into the gas stream and are carried upwards. At the surface a separating receiver is provided into which the oil-gas stream is received, and the separation of the oil from the gas can be advantageously effected by centrifuging, for which a small electric motor is required. A central compressor plant can often be employed to serve a number of wells and thus reduce labor and other costs of lifting the oil.

The power requirements of the system are small, and are near to the theoretical, because of the small compressor pressure required due to the gas quantities in relation to the oil quantities being several times greater. The friction coefficient in the delivery pipe is also quite small. The system is said to supply what is lacking in all other oil-lifting methods, as it operates with a very low power requirement, requires little attention, and the provision of only one special piece of apparatus, which is the relatively cheap atomizer.

OVERPRODUCTION IN THE FUEL OIL ERA

(Continued from Page 40)

However, the land had been given to the railroads on a checkerboard basis. Many of the sections lying between railroad lands had never been patented because of their low farming value and were now open to anyone who desired to develop them. This condition was bad in every one of the potential areas but became most serious in its effects at Kern River because of the greater immediate accessibility of that area to railroads. In a short time Kern River was suffering all of the effects of uncontrolled drilling. By 1904 its production had reached 19,608,045 bbls. and the price of crude had fallen to 17½ cents.

A pipe line had been constructed by the Pacific Coast Oil Co., representing the Standard interests, from San Francisco Bay to Coalinga. A second line had been built to Kern River but was wholly unable to handle the quantity of oil that was being offered. Coalinga oil was somewhat more desirable for refining than that of Kern River and enjoyed the advantage of being considerably nearer to San Francisco Bay than the latter. By the close of 1904 there were 3,000,000 bbls. of oil in steel storage and more than 3,500,000 in earthen storage at Kern River. As the oil averaged only 15½ degrees Baume and contained practically no light fractions, the loss from the latter type of storage was not as bad as it would have been in other fields. Despite the steady operation of the pipe line and large purchases for railroad use, half of the wells at Kern River were shut down by lack of transportation and storage facilities.

Pipe Line Construction

An independent pipe line to Monterey has been started in 1904. It was purchased in 1905 by the Associated Oil Co. at that time controlled by the Southern Pacific. The Associated then began the development of a pipe line system paralleling the lines of the Standard. Competition between the two did not develop to any great extent as the Standard was interested mainly in the lighter oils and the Associated more in the heavy oils used for fuel. However, the added facilities together with a decrease in the total production of the area as the weaker companies sold out and the control of the land came into the hands of fewer and more business-like administrators served to bring higher prices The stronger and more able producers who were dissatisfied with the low prices offered by the Standard and the Associated united to form the Producers Transportation Co., building a pipe line to Port Harford. With the construction of this line the transportation needs of the section may be said to have been satisfied for the time.

The overproduction at Kern River had brought with it a period of low prices that did not end completely until 1908. It is possible that the years of low prices were necessary to induce consumers to take up the use of fuel oil. However, the distance to coal fields would indicate that sales would have been almost the same if the average price of oil at Valley points had been 50 cents a barrel from 1901 to 1907 rather than less than half that amount. The overproduction was not without its blessings. The low prices continued through a period of sufficient length to permit larger and more stable companies to gain control of the hundreds of tracts that had been patented on homestead and placer claims in the Midway, Sunset and McKittrick areas, but could not be developed. The orderly quiet manner in which production in this area can be shut down today when a surplus is threatened by development in other areas is one of the best examples of the possibilities of co-operation between a few responsible parties.

The Mid-Continent

There may appear to be little connection between the development of the Valley Field of California and Coastal Field of Texas and Louisiana and the problems of the producer in the early years of the Mid-Continent. Their periods of overproduction should have been fresh in the minds of its producers and should have served to make them delay development until the market was ready to absorb their product and pipe lines were available to transport it. The fuel oil of California did not come into direct competition with the crude oils of the early Mid-Continent, but its gasoline and kerosene restricted the potential markets of Glenn Pool and Cushing. The development of a market for fuel oil by the pools of the Gulf Coast aided very materially in the setting of a minimum price below which Oklahoma crude could not go even if facilities to refine its product were lacking. More especially the ease with which the low grade oils of the Gulf Coast could be disposed of by those who did not have highly developed refining and marketing systems made possible the development of strong local organizations. Two of these, the Gulf company and The Texas Company, were able to enter the Mid-Continent area and compete successfully as purchasers and transporters with the Standard's organization.

Commercial production in the Mid-Continent dates from the marketing of a small amount of oil from eastern Kansas in 1889. Extensive exploitation began in that State in 1903 and 1904. In 1904 and 1905 important shallow pools were discovered in eastern Oklahoma, including such well-known areas as Coody's Bluff-Alluwe, Red Fork, Dewey-Bartlesville, and Cleveland. At the same time the Petrolia Pool was opened up in northern Texas. The Prairie Oil & Gas Co., then a subsidiary of the Standard organization, entered the field as soon as its importance was indicated. It soon became an important producer but is better known because of its activities in purchasing, storing and transporting crude oil. At first oil was shipped northeast by tank car. The cost of such shipments proved high and the company decided to build a pipe line to the Standard refinery at Whiting just outside of Chicago. Work was started in 1904 and the first shipment made in June of 1905. The capacity of the line when first completed was 13,000 bbls. a day. The production of the Mid-Continent area had risen to 11,854,822 bbls. for the year of 1905, a total in excess of the capacity of the line. No decrease of stocks was possible, the area entering the year 1906 with more

"Ready for the River"

WITH ODEE PIPE

Anything but easy, these river-crossings on line construction. When you strike such a job you're thankful to have ODEE prewelded PIPE. Those double lengths cut the worst of the work in half. You save enough in handling and field-welding to make up for other extra labor on the job.

Every length of ODEE is thoroughly inspected and broadly guaranteed. Write, wire, or 'phone for quotations on any requirement.

Jos. GREENSPON'S Sons
IRON & STEEL COMPANY
ST. LOUIS TULSA NEW YORK CITY WHEATLAND, PA.

Umbrella Roof Tanks, Amarillo, Texas

STANDARD
Oil Storage Service

Pittsburgh-Des Moines standard tanks are completely fabricated and carried in stock ready for immediate shipment. Standardized erection methods and high-grade shop work insure quick completion.

Our thirty years of tank experience is a factor in Pittsburgh-Des Moines service. Send to our nearest office for plans and estimates of oil storage tanks.

Pittsburgh-Des Moines Steel Company

13 Neville Island, Pittsburgh, Pa. 1227 Praetorian Bldg., Dallas, Texas 915 Tuttle St., Des Moines, Ia.
New York San Francisco Seattle Chicago Atlanta

H.T.P.

HEAT TRANSFER PRODUCTS

Designers and builders of general engineering equipment for

Power Plants — Refrigeration Plants
Chemical Plants — Air Conditioning
Oil Refineries — Laundries
Gas Plants — Heating & Ventilating
Textile Mills — Paper Mills, etc.

Also equipment for severe duty such as high pressures, high temperatures and unusual corrosive conditions . . . Complete engineering service furnished on any problem in these industries.

HEAT TRANSFER PRODUCTS, Inc.
90 West Street, New York, N.Y.

Thrust Bearing Insurance to the Industry

AETNA THRUST BALL BEARINGS help to insure correct thrust bearing performance to the oil industry. Lubricating engineers know that AETNA BEARINGS represent the latest development in thrust bearing manufacture because of AETNA'S policy of "Precision to your Specifications." We have earned our reputation through accuracy of production.

Our Engineering Department stands ready at any time to consult with any manufacturer in the design of special thrust ball bearings—or to quote on AETNA BEARINGS as standard equipment. Let us send you the latest Aetna Engineers' Catalog with complete specifications.

AETNA BALL BEARING MFG. COMPANY
2745 High St., Chicago, Ill.

AETNA
THRUST BALL BEARINGS

than 13,000,000 bbls. of oil in storage. Despite the completion of the longed-for outlet, producers found that the average price received for crude was only 55 cents as compared with $1.05 in 1903.

Glen Pool

In December of 1905 the first well in Glen Pool was completed. During 1906 110 wells were drilled in the area and 7,000 acres were proven productive. Full development was not attained until 1907 when for a while the area, which had been extended to include wells in the vicinity of Kiefer produced at the rate of 120,000 bbls. a day. To cap the climax, highly productive areas were developed in other areas, notably Hogshooter, Morris, and Muskogee. By the close of 1907 stocks had risen to more than 47,000,000 bbls., the pipe lines being unable to keep up with a production of 44,654,341 bbls. for the year in Oklahoma and Kansas. Prices declined to 41 cents a barrel.

To complicate the situation, eastern Illinois was throwing millions of barrels of oil of the same type on the eastern market. The Prairie organization, which was bearing the greater portion of the burden of storing the surplus Oklahoma crude, found that the profits of its expected sales at Whiting and other eastern refineries had vanished. Only the entrance of two new buying organizations prevented a complete collapse of the price structure. The Texas Company and the Gulf company both began the purchase and storage of oil at Glen Pool early in 1907. Pipe lines were started northward from the Gulf Coast at the same time. The Gulf line was completed in August, 1907, and The Texas Company began to receive oil in the following January.

While the wells at Glen Pool were not as large as those of Spindletop, they were more numerous and proved to have much better staying qualities, and the oil was of higher gravity and refinable. The production of the area remained close to the rate of 20,000,000 bbls. a year until late in 1910. Leases were being granted upon restricted Indian lands in large numbers, thus opening up many small tracts in other areas. Their checkerboarded locations and close proximity to tracts upon which oil had been discovered made offset drilling imperative. Thus while the production of Glen Pool had definitely started downward by 1911, that of the State was still rising. Only a small amount of oil was going into storage but the burden of more than 50,000,000 bbls. already there prevented any strong increase. In 1912 small increases in production occurred in all of the divisions of the Mid-Continent; but, as the Gulf Coast area was unable to develop any new pools and eastern Illinois had started to decline, producers in Oklahoma were convinced that their long period of low prices was definitely at an end. The average price paid for Oklahoma-Kansas crude was 67 4-10 cents, a material improvement over the average of 36 4-10 cents paid in 1909. Removal of oil from storage, the presence of adequate transportation, and a steady increase in market demand gave the operator every reason to feel that the time for starting test wells in new sections was at hand.

Cushing

Two of the tests, located in Creek County, proved to be of greater potential importance than the average. The first to be completed was one in Section 32-18-7 owned by Slick and Shaffer. The well was brought in on March 15, 1912, but no information concerning it could be secured. That it was an important well was proven immediately as its owners began taking leases on as much of the surrounding area as they could. It is said that they made contracts with every notary public in the town of Cushing and hired every livery rig so as to prevent others from securing leases from the farmers. The second test was completed shortly afterward by the partnership of Wrightsman and Jones, but proved to be considerably smaller than the original discovery. This was opened up after the desired leases had been secured and showed as a 150-bbl. flowing well. In the middle of April the Interior Department auctioneed off a number of tracts of restricted land distributed throughout the potential area. No oil had been shipped out but tracts of 160 acres sold for as high as $8,000 and royalty. Late in April the Prairie Oil & Gas Co. started a 4-inch line to the Slick & Shaffer well and a 2-inch line to that of Wrightsman & Jones. It also bought acreage for itself and constructed a 10,000-bbl. tank. By July the presence of at least two productive horizons, one at 2,200 feet and the other at 1,700, and the existence of a pool at least 1 mile in length had been proved. The Prairie started construction on an 18-mile 6-inch line to connect with its lines to the Cleveland Pool.

The Layton Sand

During the summer a deep test indicated the absence of productive horizons below 2,200 feet, but the presence of an important shallow sand at 1,300 to 1,400 feet, the Layton, was proved by a number of wells. Early in September, 10 wells were producing at the rate of 1,800 bbls. a day. About this time rumors of differences between T. B. Slick and C. B. Shaffer over the operation of their joint properties and between them and the Jones brothers, who owned some leases with them, began to appear. Shortly afterward the partnerships were broken up and the leases divided among the partners. In some cases individual leases were split up. Thus by the close of the year the production had reached 10,000 bbls. daily with 19 different producers shipping oil from an even larger number of small and offsetting leases.

The main source of oil at the close of 1912 was the Layton horizon. Wells were going down rapidly and purchasers were rushing their connections to secure the expected flush oil. The efforts of the Prairie, which was engaged in the construction of a second 6-inch line to Cleveland, were heartily approved by all of the producers. The Texas Company was proceeding with the construction of a line of its own and two independent refineries were projected. The Waters-Pierce Co. was attempting to contract for enough oil to warrant the construction of a pipe line. By the latter part of February, 1913, Cushing had attained a yield of 25,000 bbls. daily, with 90 more wells drilling and 60 rigs up. Seven different purchasers were actively competing for oil.

A month later production had risen 2,000 bbls. more, but the Layton sand was showing a great deal of water and operators were beginning to turn back to the deeper and more costly 2,200-foot or Wheeler horizon. In April the production turned downward, dropping nearly 10,000 bbls. a day by June. The completion of a number of wells in an extension to the north ran the production up to nearly 30,000 bbls. daily for a short time in September. However, Cushing was considered to be definitely on the down grade. Dry holes limited the pool on every side. By the middle of September, 30 strings of drilling tools were idle.

Bartlesville Horizon

It appeared that Cushing was to go down in history as a pool of no great importance and that the pipe line companies and the hastily constructed local refineries would suffer serious losses. Early in December of 1913 a deep test made by the Prairie Oil & Gas Co. found oil at 2,535 feet, the yield being 240 bbls. in 10 hours. Drillers who had worked in other sections immediately named it the Bartlesville because of its depth below the Wheeler. The Prairie had discovered what was to be one of the greatest pools of high-grade oil the world has seen. Within two weeks three other wells had reached the prolific horizon.

The conditions at the opening of 1914 seemed to combine to rush the development of the new horizon. Idle drilling tools were on the leases. Many wells in upper horizons had declined so they were hardly worth pumping. Others had struck gas which had little immediate value. Some of both types could be deepened

NO-OX-ID
IRON-RUST
TRADE MARK
The Original Rust Preventive

100% Again

Another inspection gives NO-OX-ID a 100% rating.

This time NO-OX-ID was used to save a line that had developed pitting after the first so-called protective material failed.

The report of inspection states briefly:

"12 inch line. Not a live pit could be found—all old ones being dead and no new ones forming. Inspection 100%."

The effectiveness of NO-OX-ID is its best argument. Are you using it?

DEARBORN CHEMICAL COMPANY

"A House of Chemical Engineers" In Its Forty-first Year of Service to Industry

310 South Michigan Ave., Chicago **299 Broadway, New York**

Canadian Offices and Factory: 2454-2464 Dundas St., West, Toronto

HEPPENSTALL DIAMOND "H" BITS

An entire section of our plant is devoted exclusively to the manufacture of Diamond "H" Bit and Jar Steel.

This specialization, extending over 39 years, is your constant assurance of obtaining the very highest grade Bit Steel Blocks it is possible to produce.

A good reason why you should always specify genuine Diamond "H" Bit.

HEPPENSTALL FORGE AND KNIFE COMPANY

PITTSBURGH, PENNA.

Fort Worth—Texas Office:
1415 F. & M. Bank Bldg.

Los Angeles— Calif. Office:
124 W. Fourth St.

"IWANA" Hair Belting

"Favorite of the Oil Fields" and UNRIVALLED for SERVICE

Will outwear and stand more hard use and abuse than any other make of BELTING.

Manufactured by
Fenwick-Reddaway Mfg. Co.
Newark, N. J.

CAMEL'S HAIR, COTTON and LINEN PRODUCTS
Mid-Continent Representative
ARCH F. CAMPBELL, P. O. Box 171, Tulsa, Okla.
Phone 2-1117

All Under One Cover
No Side Lines

You can get more good out of The Oil and Gas Journal than you can from all other oil papers combined.

It is edited, compiled and published with but one thought in mind—and that is to give you absolutely reliable, honest and accurate information every week—52 times a year.

The Oil and Gas Journal is the oldest oil publication in the world. Since the very beginning it has devoted all its energy and talents to but one thing—publishing The Oil and Gas Journal.

It has no side lines—it never will. The Oil and Gas Journal realizes that its readers are eager to get complete, accurate, quick information UNDER ONE COVER without being forced to purchase supplementary reference books at premium prices.

Therefore, it bends all its efforts toward giving you the benefits of its entire organization which extends in all directions from Tulsa, Okla., to the far corners of the world,—Russia, Persia, Rumania, Palembang, Chili, Venezuela, Italy, Yugoslavia, Borneo, Egypt, Ceram, Japan, Canada.

Read The Oil and Gas Journal every week and always renew your subscription promptly.

The OIL and GAS JOURNAL
PRODUCING REFINING ENGINEERING MARKETING
Tulsa, Oklahoma

Carbondale Refrigeration
CARMACO *for Refiners*

Send for a Copy of our Wax Plant Bulletin

Design of Complete Wax Plants—Absorption and Compression Refrigerating Machines—Wax Distillate Chilling Machines—High Pressure Filter Presses—Paraffine Wax Sweaters—Heat Exchangers and other Refinery Equipment.

CARBONDALE MACHINE COMPANY—Carbondale, Pa.

District Offices
New York, Cleveland, Dallas, New Orleans, Philadelphia, Kansas City, Pittsburgh, Chicago, Los Angeles, Houston, Tulsa, Buffalo

STEEL PLATE CONSTRUCTION

Stills, Refinery equipment of every kind.
Steel Oil Storage Tanks, Condensers,
Fabricated and Erected

RITER-CONLEY COMPANY
General Offices—Pittsburgh, Pa.

with ease. The average depth to the horizon when new wells were started was only 2,600 feet. No less than seven purchasers were actively competing for the oil. Most important of all, the general form of the structure had been outlined and the probable territory was in the hands of a large number of concerns and consisted of a large number of small leases. By the end of March, 30 wells with a production of 50,000 bbls. a day had reached the Bartlesville. There were 50 more wells drilling and an additional 40 rigs were up. James O'Neil of the Prairie had warned the operators against uncontrolled drilling in December; his company now announced that it could not handle all the oil that was being offered to it and was already putting 17,000 bbls. into storage. While other purchasers had taken twice as much oil as the Prairie in the previous summer, they were unable to develop their capacity to meet this emergency.

Healdton

To complete the picture one must go south to Healdton, where a 300-bbl. well had been completed in September, 1913, at a depth of 900 feet. A second gusher had been completed shortly afterward and proved the existence of a pool of major proportions. The acreage was split up into tracts even smaller than those at Cushing. These were eagerly sought at prices as high as $1,000 an acre. The Magnolia Petroleum Co. had started construction on a pipe line from Beaumont through several pools in northern Texas to Healdton. It began purchasing oil to run to storage. When the pipe line was completed it allotted 4,000 bbls. to Healdton, the rest of its capacity being reserved for the Texas pools. As the supply of oil was far in excess of its needs, it cut the price on all oil below 32 degrees Baume from $1.05 down to 70 cents on March 2. Healdton operators immediately protested to the State Corporation Commission of Oklahoma that this was discrimination. The Magnolia replied that the oil contained sulphur and was of low refining value. Practically all of the Healdton crude turned out to be of the same grade and the Magnolia cut prices again, bringing its price down to 50 cents a barrel. Healdton was aroused to a feverish pitch. Production had reached a total of somewhere between 25,000 and 35,000 bbls. by May. At least 200,000 bbls. had been run into open storage alone. A meeting of the operators, the attorney general, and the Corporation Commission was called. The Magnolia was ordered to build storage, increase runs from 4,000 to 8,000 bbls., to prorate runs, and to make no further price cuts without giving five days' notice. Wirt Franklin was appointed umpire to supervise operations in the Healdton area.

Proration at Cushing

In Cushing, despite the warning of the Prairie, production from the Bartlesville had risen to 65,000 bbls. by April 30 and the number of drilling wells had doubled. The Prairie had made five cuts in price during the month of April, reducing oil from $1.05 to 75 cents a barrel, and had put a 75 per cent proration order into effect. On May 6 the Corporation Commission secured the consent of the Prairie to a ruling that no further cuts would be made without five days' notice. As the production of Cushing passed the 100,000 bbls. a day figure, the situation took on national importance. Senator Gore introduced a measure at Washington calling for the construction of a government pipe line from Oklahoma to the Gulf Coast. This line was to serve the joint purpose of assuring the navy a supply of crude and relieving the overproduction in Oklahoma. A committee of oil men journeyed to Washington in the interests of this and similar suggestions. Hearings were held in Oklahoma by representatives of the Indian Bureau and the Navy. As prices went down, the producers became bitter against the pipe line and purchasing companies, such as Prairie, claiming that they as producers had aided in creating the overproduction. An association of producers at Okmulgee passed a resolution condemning producers who acted as purchasers and telegraphed to Washington requesting the Government to purchase 10,000,000 bbls. of independently owned storage for the Navy.

MID-CONTINENT FIELD
Production and Price Statistics, 1901-1916*

	Yearly production in bbls.	Average price per bbl.
1901	989,696	$.787
1902	986,720	.756
1903	1,573,085	1.046
1904	6,186,629	.947
1905	12,533,777	.551
1906	22,839,911	.454
1907	46,896,267	.410
1908	48,823,747	.392
1909	50,833,740	.371
1910	59,217,582	.391
1911	66,595,477	.479
1912	65,473,323	.692
1913	84,920,225	.951
1914	†97,994,900	.803
1915	123,294,317	.587
1916	136,934,439	1.189

*Does not include 19,550,000 bbls. produced in Cushing and Healdton and placed in field storage.
†After United States Geological Survey.

During May the Corporation Commission exempted the pipe lines from the requirements of the Yeager-Strain law (which required that all purchases be prorated) to permit them to take the full production of the small settled leases. Owners of these were feeling the effects of the competition of flush oil much more than the producers of that oil were feeling the price cuts. On June 30 it relieved the lines from the necessity as common carriers of connecting up to new wells unless those wells were offsets, completions made because of lease terms, or had been started prior to July first. This ruling was made immediately after a meeting of operators from the whole of the State with the Corporation Commission in which the operators agreed to start no new wells for a period of 120 days except offset wells and those needed to hold leases. No oil was to be sold at a discount below the pipe line price. A committee was appointed to consider any special cases that might arise. The agreement was announced as an order of the Corporation Commission to apply in all areas of the State except Healdton and the Osage. An umpire was appointed to handle the situation at Cushing.

Crisis at Cushing

The only wells in the Cushing area that were prevented from drilling were inside locations and edge wells. The greater part of the proposed wells had to be drilled because of offset conditions. During the summer the potential production of Cushing averaged about 150,000 bbls. daily. Of this probably 20 per cent was removed by pipe lines. The remainder went into storage, out by rail, or was shut in. Healdton's potential was about 55,000 bbls., only 12,000 of which could be handled by pipe in the late summer. Transportation facilities began to improve early in the fall, but the fear of rapid development of tracts adjacent to a discovery well north of the center of production led the Prairie to cut prices again in September. That this fear was not without good basis was shown by the steady increase of the area as a whole and of the northern section in particular throughout the fall and winter. The actual peak production occurred early in April of 1915 when the yield for a few days was more than 300,000 bbls.

Corporation Commissioner Henshaw had admitted doubt of the legality of orders issued to put in force the agreements made by the operators on June 25. He and the commission had been assailed on all sides throughout the summer in the Federal and State courts. The commission had been forced to compromise at every turn but had managed to keep a resemblance of authority. On September 22 when the Prairie made its second cut in 10 days and brought the price of oil from 65 cents to 55 cents, the commission attempted to force the maintenance of the former price. The Prairie replied by cutting off connections with producers' tanks. The producers now turned on the commission completely and forced it to issue another order recognizing the lower price. The Prairie then began to take oil again. The Corporation Commission issued a 90-day shut-down order on September 30 and also ruled that no wells should be shot. However, it was generally felt that these orders were

PROTEX

New and GOOD

ALL STEEL UPPER VALVE

Thoroughly field tested this Upper Valve has proven an instant success. The outstanding feature of the Protex Valve is that there can be no loss of Cups and Cup Rings which occurs when the bottom of regular Valve becomes unscrewed; Protex is a safety unit; available with regular length Crown or with Long Crown in 4, 6 and 8 Cups to meet your requirements; other weights and sizes to fit any condition.

THE CHARLES N. HOUGH MFG. CO.
Franklin, Penna.

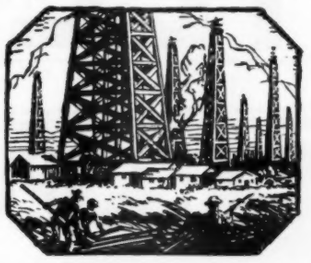
C. O. SHUMAKER
Sales Representative
1143 Xanthus St.,
Tulsa, Okla.

C. R. BROOKS
Sales Representative
1632 West Humboldt St.,
Fort Worth, Texas

Products That Cut Down Your Underground Overhead

ASCO STEEL

STANDS SUPREME In the Oil and Gas Fields



Our metallurgists are men who have had first hand experience in the Oil Fields. They have studied the performance of Oil Well Tools under the most trying conditions. Asco Steel is being produced to meet these conditions and the increasing demand has proven all that we claimed for it.

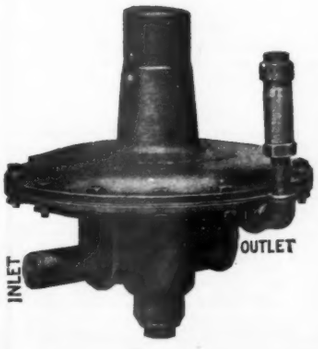
DISTRICT OFFICES
541 McCormick Bldg., Chicago, Ills.
503 Philtower Bldg., Tulsa, Okla.

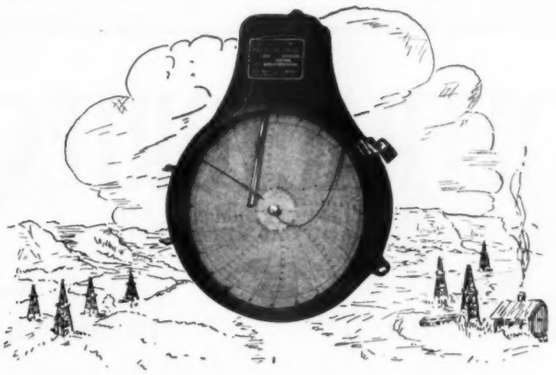
THE ANDREWS STEEL CO.
NEWPORT ASCO KENTUCKY

FULTON HOUSE-SERVICE REGULATOR

Equipped with a highly efficient spring valve which automatically reduces intake pressures to any desired degree. It is strongly recommended by its valve seat feature which our catalogue fully explains. Send for your copy today.

THE CHAPLIN-FULTON MFG. CO.
28-40 Penn Ave. Pittsburgh, Pa.





That new Bristol's Model 11-M Recording Pressure Gauge

Developed especially for use where exposure to dust, fumes, moisture, etc., is unavoidable, this model Bristol's Gauge is suitable for installing out-of-doors on oil or gas pipe lines, gas storage tanks, at gas or oil well, stills, etc., etc.

Instrument case is made of aluminum alloy—(not zinc)—which prevents rusting. Entire case front is designed to swing open, thus giving ready access to interior parts and facilitating easy changing of charts.

The pear-shaped Original "Bristol's Form" employed in the design of this instrument is ideal for most efficient mounting of operating mechanism. The long penarm is direct connected to measuring element, and due to this fact records over entire chart scale with minimum expansion strain on pressure element. No multiplying devices whatsoever are used. All of which makes for accuracy, trouble-free operation, and exceptionally long service life.

THE BRISTOL COMPANY
Waterbury, Connecticut

SALES ENGINEERING SERVICE WITHOUT OBLIGATION. WRITE FOR CATALOGS AND BULLETINS.

RYERSON

IMMEDIATE SHIPMENT FROM STOCK

Bars, Plates, Rivets, Tool Steel, Shapes, Sheets, Bolts, Welding Rods, Structurals, Tubes, Wire, Concrete, Reinforcing, Rails, Pipe, Turnbuckles, Alloy Steel, Ascoloy, Small Tools, Machine Tools, etc.

Write for the Ryerson Journal and Stock List.

JOSEPH T. RYERSON & SON INC.

Chicago Milwaukee St. Louis Cincinnati Cleveland
Detroit Buffalo New York Boston

Tulsa Office: 410 Atlas Life Bldg.

STEEL

Houston Office: D. S. Mair 220 Main Street

MYERS PUMPS FOR EVERY PURPOSE

We are manufacturers of an extensive line of Well, House and Cistern Pumps, Hand and Power Water Systems for homes, farms, country estates, public and private institutions; Self-Oiling Power Pumps and Working Heads for oil and gas fields, mill, mine or factory, railroads, highway and general contractors. Ours is an established line with over fifty years of pump building experience behind it to guarantee quality and dependability.

If you have water problems to solve, either in a large or small way, write us for information and catalog.

THE F.E.MYERS & BRO. Co. Ashland, Ohio.

MANUFACTURERS FOR OVER FIFTY YEARS OF MYERS "HONOR-BILT" PUMPS FOR EVERY PURPOSE • WATER SYSTEMS • HAY UNLOADING TOOLS AND DOOR HANGERS

REFRACTORIES

TO SATISFY EVERY NEED OF OIL AND GAS REFINERS

THERMOLITH
"The High Temperature Cement for Fire Clay Brick"

TRADE MARK

FIREBOND
"The Harbison-Walker Cement for Silica Brick"

Consulting Service Free

HARBISON-WALKER REFRACTORIES CO.
World's Largest Producers of Refractories
Pittsburgh, Pa. *U.S.A.*

Ventilators

Southern Cornice Works

Oil Field Work a Specialty

Phone 2-1546

118-120 So. Cincinnati

TULSA, OKLA.

issued mainly to maintain the appearance of authority. Certainly they had no effect upon the continued development of Cushing.

Beginning of Decline

During the year of 1914 approximately 41,700,000 bbls. of oil had been taken from the Bartlesville horizon of Cushing. About 13,000,000 bbls. had been removed by the pipe lines. About 9,100,000 bbls. had been taken by miscellaneous buyers and approximately 19,600,000 bbls. had gone into storage. Tank building was still active as late as March, 1915, but by that time it was realized that the pool was nearing its last days as a market breaker and that the pipe lines would soon be able to handle all of the oil that could be produced. However, the market structure was weak throughout the whole of the first half of 1915. In February the steadily rising production of the northern extension caused the Prairie to cut prices to 40 cents a barrel. This price as a matter of fact was only a nominal one, the bulk of the oil being sold by contract on terms that were privately arranged. Large quantities were sold at between 30 and 40 cents a barrel.

While shooting and deepening of wells served to delay the decline which began in the middle of April, their effects were strictly temporary. By the end of July production had dropped more than 100,000 bbls. below its peak. At the close of October it was down to 150,000 bbls. from 1,125 wells. Prices responded immediately, the posted price rising to $1.20 a barrel before the close of the year, a price exactly three times the figure which had been quoted from February to August. Prices at Healdton had declined to 30 cents in February. Its heavy oil was not attractive as long as the high quality crude of Cushing was available. As this started to decline, the needed transportation facilities were supplied. Prices began to rise slowly in the fall of 1915 and reached 80 cents a barrel in the spring of the following year. At the end of 1915 storage in the Mid-Continent area contained more than 100,000,000 bbls. of oil. Two-thirds of this was owned by the major purchasing and pipe line companies, the remainder was in the hands of producers. To those who owned this oil the rising prices meant large profits. The hundreds of owners of small leases had nothing to balance the losses they had suffered when Cushing's flush yield shattered the price structure of the Mid-Continent Field. However, a better day was at hand. The war boom was on and the automobile was sweeping over the country. Even the discovery of the great pools at Eldorado and Augusta in Kansas could not meet the needs of the market. Oil was coming out of storage and prices were rising to unprecedented heights. The operators, who had developed Cushing and lost millions of dollars of potential profits because of their inability to keep their oil until the flood was over, turned their attention to the search for more, using the same system of checkerboard leasing and competitive drilling as before.

Urged on Wildcatter

The overproduction of Spindletop and related pools at the opening of the century was largely local in its effects upon the price structure of the oil industry. Its effects did not last long because of the extent of the market for its product, its close proximity to that market, and the fact that the search for new pools was not immediately successful. The ef-

LEGAL

TRIBAL OSAGE OIL LEASES AT PUBLIC AUCTION, DECEMBER 11, 1928, BY UNITED STATES GOVERNMENT

December 11, 1928, at Pawhuska, Oklahoma, about 30,000 acres will be offered for oil leases in quarter section tracts. Bids will be for bonus in addition to royalties, 25% payable on day of sale, balance in three annual instalments, with acceptable security. Within advertised area there are about 9,870 wells producing from one barrel to 400 barrels each, the total daily production for August, 1928, being about 50,300 barrels; also, there are about 50 wells drilling. All lands are now leased separately for gas. Blue print maps of area advertised, showing tracts producing oil or gas, can be had for fifty cents each, also logs of producing oil or gas wells for twenty-five cents each well. Write U. S. Superintendent, Osage Agency, Pawhuska, Oklahoma, for maps, logs or other information.

Treat CUT OIL with TRET-O-LITE

the SIMPLEST MOST ECONOMICAL MOST RAPID METHOD

The Tret-O-litE Process is a fundamentally simple and direct method of correcting the chemical condition present in "cut oil." Treatment with Tret-O-litE causes the petroleum and water to separate *quickly* and *completely*. Cost of treatment is exceedingly low. Let us send our nearest field expert to see you.

Process Patented

WM. S. BARNICKEL & CO.
St. Louis, Mo.
Offices and Plant:
Webster Groves,
St. Louis County, Mo.

Absolute Merit

and exact conformity to truth in publishing the facts of every branch of the Oil Business has elevated The Oil and Gas Journal to the position of esteem and respect in which it is held by real Oil Men everywhere.

"The Oil Man's Bible"

The OIL and GAS JOURNAL
Tulsa, Okla.

OIL-FREE AIR

Leader

Air Units

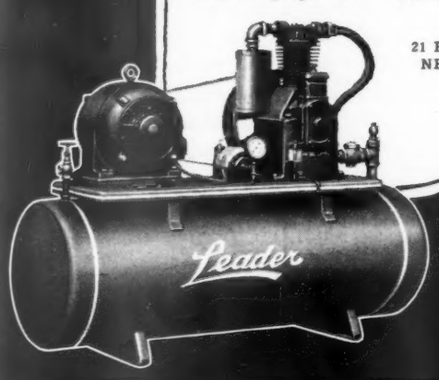
Provided with Laidlaw Feather Valves, Pressure Lubrication and a dozen other features.

Write for Bulletin telling about these economical, low-price units.

LEADER IRON WORKS

2130 N. Jasper St. Decatur, Illinois

21 East 40th St., NEW YORK, N. Y.



PATRICK CARBON

for Diamond Core Drilling

"Specify Patrick Carbon"

MANY years of carbon buying and grading is back of the Patrick Reputation. Your faith in this service is therefore secure and well founded. Patrick Carbon Service means complete satisfaction.

SEND FOR BOOKLET

You can get in touch with our representative by wiring Duluth office

R. S. PATRICK

Duluth, Minnesota, U.S.A.

Cable Address "Exploring" Duluth

Thorough cleaning *with no fire hazard*

LARGE savings of time and hard work are important advantages offered by Oakite cleaning. Even with the simplest of equipment—as one southern oil company recently found—Oakite methods are unmatched in speed and thoroughness.

Here an oil drum was filled with a solution of an Oakite material and heated by gas. Gate valves, pipe fittings and similar equipment were soaked a short time and removed, rinsed, and found *completely clean*. No hand scrubbing was necessary.

You clean safely, too, the Oakite way. Water solutions eliminate all fire hazard. Decide now to find out more about Oakite cleaning. Our booklet "Oakite in the Oil Industry," gives directions and suggestions for a wide range of cleaning operations. Let us put a copy in the mail for you.

Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the U. S. and Canada.

Manufactured only by

OAKITE PRODUCTS, INC., 44C Thames Street, NEW YORK, N. Y.

OAKITE

TRADE MARK REG. U.S. PAT. OFF.

Industrial Cleaning Materials and Methods

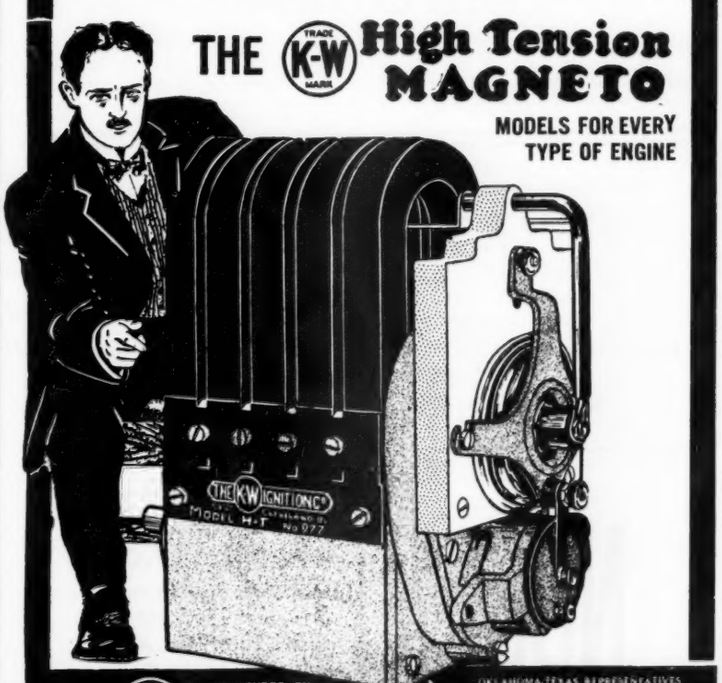
JUST AS STURDY AND RELIABLE AS IT LOOKS

A GIANT FOR POWER

A BRUTE FOR ENDURANCE

THE (TRADE K-W MARK) High Tension MAGNETO

MODELS FOR EVERY TYPE OF ENGINE



MANUFACTURED BY

THE (TRADE K-W MARK) IGNITION CORP.

CLEVELAND OHIO U.S.A.

OKLAHOMA-TEXAS REPRESENTATIVES

MAGNETO IGNITION CORP.

328 E. SECOND STREET

TULSA, OKLAHOMA

Ross-Meehan Foundries

Manufacturers

"Electric Steel Castings—Electrically Annealed," "Certified Malleable Iron Castings," "Meehanite Metal Castings," Gray Iron Castings, and Special Analysis Castings.

For

Oil Producers and Refiners

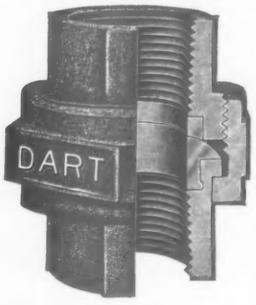
River Clamps a Specialty

Chattanooga, Tenn., U. S. A.

DART UNIONS and FLANGES

Two Bronze Seats

May we send you sample to try on your most troublesome line? It is absolutely free. Write today for catalogue "O."



E. M. Dart Mfg. Co., Providence, R. I.

The Fairbanks Co.,—Distributors

NATIONAL PETROLEUM ENGINEERING COMPANY

Engineers & Geologists

TULSA, OKLAHOMA

APPRAISALS
REPORTS-COMMERCIAL & TAX

SURVEYS
ESTIMATES OF OIL RESERVES

AN EXPERIENCED OIL FIELD ORGANIZATION

Nine Years' continuous Royalty Dealings in Mid-Continent fields.

F. O. HARRELL

ROYALTIES

302 City National Bank Building, Wichita Falls, Texas

Specializing in undeveloped royalties in favorable districts, passed upon by my own geological and geophysical staff.

INQUIRIES INVITED FROM ROYALTY BUYERS.

NUGENT OIL FILTERS

Oiling Systems
Oiling Devices

408 N. HERMITAGE AVE.
CHICAGO U.S.A. ESTD. 1897

fects of the large production of Kern River were largely restricted to a relatively small area because of the absence of transportation. The postponing of the development of near-by and known reserves can be traced to the continuance of those low prices until all but the strongest and most capable operators had sold out.

In Oklahoma, the wide distribution of the oil, the relatively shallow depth at which much of the oil was found, and the greater immediate demand for its higher grade crude urged on the early wildcatter. Active competition between large purchasers forced them to construct transportation facilities but it also urged them to purchase more oil than they could handle to insure against future shortages. These never came as the wildcatter added new pools in rapid succession and the wide distribution of leases forced immediate development of each discovery. The Cushing disaster of 1914 and 1915 was merely the climax of a condition which started with the discovery of Glen Pool.

That history repeats itself was fully demonstrated at Cushing. The warnings of purchasers were disregarded by operators. When the overproduction could not be stopped, the producers as in Pennsylvania 40 years earlier turned to shutdowns. State aid was sought. The actions of the pipe line and purchasing companies were criticized. Federal action was called on to remedy the condition. However, as in Pennsylvania the condition was not cured until a bitter period of low prices had been passed through and the rate of consumption had caught up with production. The complete failure of every method sought to end the drilling orgy and the fall of prices that had begun with the discovery of the Bartlesville horizon at Cushing should be adequate proof to everyone that the time to prevent overproduction is before the second well has started and not when the size of the potential production has been determined by 10 to 20 tests. As long as the oil industry remains organized on a competitive basis, each new discovery remains potentially a market breaker until proven otherwise and should be treated as such.

LEGAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
Office of the Secretary
Washington

Call for Bids to Purchase Government Royalty Oil from Salt Creek field, Wyoming.

The Secretary of the Interior invites sealed bids to be submitted at his office, Interior Department Building, Washington, D. C., on or before noon of December 10, 1928, for the royalty oil accruing to the United States from leases on Government land within the Salt Creek oil field in the State of Wyoming, for a period of three (3) years beginning January 1, 1929. For the calendar year 1927 the total Government royalty oil from the Salt Creek field amounted to approximately 1,920,000 barrels, and for the period from January 1 to August 31, 1928, to approximately 1,280,000 barrels, the average gravity in both years being in the range from 36.0 to 36.9 degrees A.P.I.

Bids must be based upon the highest posted field price for oil of like gravity in Oklahoma and Kansas, and or in Wyoming, whichever is the higher, and must be stated as a differential in cents per barrel from such posted price. Delivery of royalty oil will be made on each leasehold for the account of the successful bidder. Payments for the royalty oil are to be made to the Register of the United States Land Office at Cheyenne, Wyoming, on or before the fifteenth (15th) day of each month following that in which delivery is made and shall be computed on the basis of tank measurement with two (2) per cent strapping in terms of standard barrels at sixty (60) degrees Fahrenheit.

The successful bidder will be required to furnish a corporate surety bond in the sum of $250,000 conditioned upon full and complete compliance with the terms of the contract.

The Secretary of the Interior may accept any bid which in his judgment is most advantageous to the Government, and reserves the right to reject any or all bids.

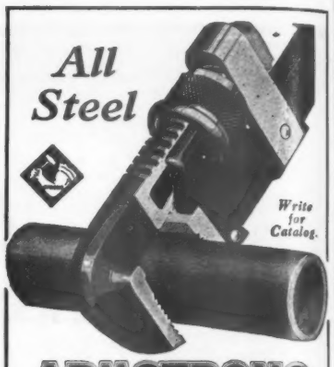
Sealed bids are to be submitted to the Secretary, Department of the Interior, Washington, D. C., the envelope to be marked plainly, "Bid on Salt Creek royalty oil." No bids received after the time herein fixed for submitting bids will be considered.

Additional information can be obtained from the Geological Survey, Department of the Interior, Washington, D. C., or from the field offices of the Geological Survey at Casper, Wyoming.

ROY O. WEST,
Secretary of the Interior.

October 30, 1928.

All Steel



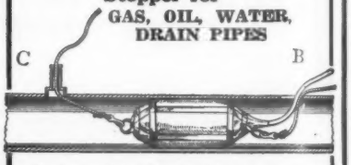
Write for Catalog.

ARMSTRONG

Pipe Wrench is drop forged steel throughout. Patented "ball and socket" nut action eliminates the need for a "frame" or nut housing, increases the flexibility and gives vastly greater strength. Side pull is taken up by forged lugs. Adjustment nut cannot fall out. The handle, not restricted to size of a "frame," is oversize at the point of greatest strain. Tool steel replaceable lower jaw. Sizes 8" to 36".

ARMSTRONG BROS. TOOL CO.
The Tool Holder People
330 N. Francisco Ave., Chicago, U. S. A.

Goodman Cylindrical Stopper for GAS, OIL, WATER, DRAIN PIPES



Safety Gas Main Stopper Co.
523 Atlantic Ave.,
Brooklyn, N. Y.

When—

changing your address always give the old as well as the new.

The OIL and GAS JOURNAL
Tulsa, Okla.

LELAND E. FISKE
Certified Public Accountant (Indiana)
Valuation Engineer
216 Atlas Life Bldg., Tulsa, Okla.
Specialist in Oil Property Taxation, Appraisal and Accounting

ARTHUR C. BROWN
SOLICITOR OF UNITED STATES AND FOREIGN PATENTS
406-412 KENNEDY BLDG.
Tulsa, Okla.
Mr. Fred Krueger
in Charge
Phone 4-2319

Chester W. Washburne
Geologist and Engineer
27 William St., N. Y.

TEXAS OIL MAPS
County and District
Catalog on Application
HEYDRICK MAPPING COMPANY
Wichita Falls, Texas

Theory Today—Practice Tomorrow

One of the most interesting letters from subscribers to The Oil and Gas Journal came in last week. This is an extract:

"What stands out for me is that by reading The Oil and Gas Journal I can familiarize myself with theories that in a very short time become the accepted practice of the industry. There was the air and gas lift for example. When The Journal began printing articles about it a lot of fellows thought it was high-brow stuff, of no practical interest to the men in the field. But those of us who were interested and followed up those articles were in on the ground floor when the new method began to come into general use.

"This is just one outstanding case where The Oil and Gas Journal has been of immense benefit to me and a lot of others. I read the discussions by Mr. Mills, the field problem page, and in fact every article that is published dealing with new ways of doing things in the oil country. It's an education that cannot be obtained anywhere else and certainly not for the cost of a subscription to The Journal."

Keep in Touch by Using This Coupon

ORDER BLANK
The Oil and Gas Journal, Tulsa, Okla.

You are hereby directed to mail The Oil and Gas Journal to me for ..... year. Enclosed find remittance $.....

Classify my interests as checked by me.

.....Producing .....Refining

.....Equipment .....Marketing

.....Transportation

Name .....

Address .....

City .....

U. S. OR MEXICO	
One Year	$6.00
Six Months	3.00
Three Months	2.00
FOREIGN	7.00

Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS

Pipe Line Statement for September

Runs

Company—	Month bbls.	Dly. av. bbls.
Prairie P. L. Co.*	4,425,000	147,500
Gulf P. L. Co.	1,543,157	51,439
Texas P. L. Co.	825,412	27,514
Magnolia P. L. Co.	2,021,613	67,387
Empire P. L. Co.	1,051,830	35,061
Cosden P. L. Co.	938,043	31,268
Sinclair P. L. Co.	3,546,000	118,200
Oklahoma P. L. Co.	3,627,300	120,910
Other lines	7,530,000	251,000
Total September	25,508,355	850,279
Total August	23,339,806	752,887
Difference	2,168,549	97,392

Shipments

Prairie P. L. Co.†	5,794,603	193,153
Gulf P. L. Co.	1,599,359	53,312
Texas P. L. Co.	1,058,939	35,298
Magnolia Pet. Co.	1,992,678	66,422
Empire P. L. Co.	1,056,498	35,217
Cosden P. L. Co.	730,643	24,355
Sinclair P. L. Co.†	3,414,431	113,814
Oklahoma P. L. Co.	3,433,505	114,450
Other lines	6,180,000	206,000
Total September	25,260,656	842,021
Total August	24,872,351	802,333

Stocks

Prairie O. & G. Co.	31,550,000
Prairie P. L. Co.	2,250,000
Gulf P. L. and Gypsy Oil Cos.	10,129,332
The Texas Company	6,778,513
Magnolia Pet. Co.	8,805,178
Empire P. L. Co.	3,649,650
Mid-Continent Pet. Corp.	3,552,713
Sinclair Crude Oil Pur. Co.	20,000,000
Carter Oil Co.	12,091,810
Oklahoma P. L. Co.	3,085,616
Other lines	11,500,000
Total September	113,392,812
Total August	112,768,329
Difference	624,483

*Estimated. †Prairie P. L. shipments include Texas crude oil and Sinclair shipments include Texas and Wyoming crude oil.

NOTE—Stocks do not include approximately 8,200,000 bbls. of crude oil held in storage on private tank farms and leases and approximately 250,000 bbls. of Texas Panhandle crude oil in storage in Oklahoma.

EASTERN PIPE LINE REPORT

Runs From Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for August and September:

	Aug., '28	Sept., '28
National Transit	170,904.52	157,168.79
S. W. Pa. P. L.	91,112.38	81,070.62
Eureka P. L.	381,023.25	345,505.60
Buckeye P. L. (Macksburg)	367,692.66	321,117.10
Buckeye P. L. (Cleve)	11,928.55	11,281.62
Buckeye P. L. (Lima, etc.)	120,600.29	108,830.90
Indiana P. L.	7,013.10	6,387.52
Cumberland P. L.	223,338.19	193,343.46
N. Y. Transit	25,007.11	23,100.70
Tidewater P. L.	220,230.22	204,507.93
Pure Oil	65,261.50	59,111.90
Emery P. L.	61,506.60	57,782.02
Paragon Dev.	34,022.80	26,168.86
Stoll Oil. Ref.	10,447.17	9,243.26
Total	1,790,088.34	1,604,620.28
Daily average	57,744.78	53,487.34

Note—Indian Refining Co. also reported other receipts of 357,570.08 bbls. Paragon Refining Co. had other receipts of 183,883.-44 bbls. Paragon Development had other receipts of 719.21 bbls.

Petroleum Deliveries

The following tables exhibit the shipments of regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky at the close of August and September:

	Aug., '28	Sept., '28
National Transit	572,070.14	532,771.70
S. W. P. P. L.	462,872.37	481,986.45
Eureka P. L.	224,817.97	213,103.59
Buckeye P. L. (Macksburg)	148,487.46	142,859.81
Buckeye P. L. (Cleve)	2,673.05	1,697.10
Buckeye P. L. (Lima, etc.)	1,512,473.28	1,399,448.58
Indiana P. L.	1,426,376.89	1,379,998.87
Cumberland P. L.	181,480.36	297,672.12
N. Y. Transit	213,009.28	240,697.91
Northern P. L.	316,097.83	301,912.35
Tidewater P. L.	177,158.38	124,606.05
Pure Oil	62,891.44	62,090.54
Emery P. L.	56,960.09	61,266.58
Paragon Ref.	189,693.84	190,716.50
Indian Ref.	393,569.13	366,303.28
Paragon Dev.	37,817.61	27,004.95
Total	5,978,449.12	5,824,136.38
Daily average	192,853.19	194,137.88

Gross Stocks

The gross stocks held by various pipe lines in the oil-producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky and Indiana for August and September:

	Aug., '28	Sept., '28
National Transit	1,125,875.48	1,034,508.62
S. W. Pa. P. L.	712,493.58	607,019.77
Eureka P. L.	1,102,757.62	1,144,172.16
Buckeye P. L. (Macksburg)	540,894.00	507,516.69
Buckeye P. L. (Cleve)	46,048.37	42,976.72
Buckeye P. L. (Lima, etc.)	3,717,960.51	3,600,695.49
Indiana P. L.	598,136.05	602,500.63
Cumberland P. L.	632,613.31	511,311.43
Southern P. L.	410,757.10	414,022.54
N. Y. Transit	706,799.19	612,289.36
Northern P. L.	458,296.62	424,456.32
Pure Oil	63,850.93	64,141.86
Emery P. L.	8,656.13	9,373.75
Paragon Ref.	23,167.67	16,042.95
Indian Ref.	69,892.18	61,936.95
Paragon Dev.	7,544.29	7,944.96
Total	10,236,743.03	9,660,910.34
Decrease	582,587.91	575,832.69

Grades of Oil

The following table shows the amount of the different grades of oil held by the Eastern Pipe Lines at the close of August and September showing the gross stocks of the above fields:

	Aug., '28	Sept., '28
Pennsylvania	3,368,647.01	3,227,574.95
Lima	965,466.57	969,628.64
Kentucky	993,362.71	831,752.66
Mid-Continent	4,857,572.08	4,560,201.79
Illinois	51,694.66	71,752.30
Total	10,236,743.03	9,660,910.34

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1925	1926	1927	1928
Jan.	56,831	55,630	56,209	52,904
Feb.	60,606	60,394	61,298	57,002
Mar.	60,575	61,644	63,247	57,485
April	63,062	63,019	60,337	56,812
May	59,217	60,580	60,284	62,067
June	61,270	61,131	62,757	58,220
July	62,639	63,206	58,674	57,144
Aug.	69,686	61,815	60,870	57,745
Sept.	62,510	64,639	60,285	53,487
Oct.	145,388	161,132	147,036	.....
Nov.	59,350	61,774	57,275	.....
Dec.	57,974	58,755	53,089	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1925	1926	1927	1928
Jan.	157,889	156,056	141,227	146,465
Feb.	160,863	159,488	138,534	167,368
Mar.	154,591	150,239	133,777	159,883
April	151,429	152,371	140,227	172,935
May	146,995	160,998	144,594	180,559
June	149,467	160,257	149,772	188,034
July	161,338	160,045	151,850	189,470
Aug.	161,730	151,929	188,653	192,853
Sept.	156,719	158,915	144,213	194,138
Oct.	145,388	161,132	147,036	.....
Nov.	143,582	152,608	150,975	.....
Dec.	150,162	136,428	144,504	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1926	1927	1928
Jan.	9,859,170	9,718,008	12,276,710
Feb.	9,579,354	10,119,162	12,180,410
Mar.	9,438,292	10,794,044	12,239,726
April	9,805,851	11,113,295	11,740,136
May	9,531,757	11,359,381	11,602,468
June	9,585,904	11,493,673	11,287,673
July	9,734,687	11,458,128	10,819,321
Aug.	9,058,947	11,989,115	10,236,743
Sept.	9,436,732	12,212,716	9,660,910
Oct.	9,269,806	12,047,661	.....
Nov.	9,257,067	11,939,740	.....
Dec.	9,454,512	12,340,297	.....

Franklin Pipe Line Co.

The following table exhibits the condition of the Franklin Pipe Line at the close of business for the months named and not counted in the stocks and averages reported above:

1927	Runs	Shipments	Stocks
Sept.	3,309.56	2,656.48	19,372.25
Oct.	2,801.32	1,226.99	20,946.58
Nov.	2,746.50	2,220.53	31,472.55
Dec.	2,779.86	1,893.69	22,358.72
1928—			
Jan.	1,886.06	2,424.79	21,819.99
Feb.	2,460.14	3,109.34	21,170.79
March	2,578.86	3,540.33	20,209.32
June	3,153.08	2,779.02	17,922.58
July	2,902.50	3,628.02	17,197.06
Aug.	2,874.11	2,350.13	17,721.04
Sept.	2,820.31	5,255.42	15,385.93

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, Oct. 1	2,085,377.67
Runs from wells	545,420.55
Other receipts	405,258.98
Regular deliveries	654,033.74
Other deliveries	383,379.16

The amount of Illinois oil run by the Tidewater Pipe Co. in September was 24,-887.36 bbls. Deliveries were 83,259.76 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveris as follows:

	Runs	Deliveries
1927—		
September	619,580.49	433,212.49
October	601,099.25	408,287.58
November	605,621.14	415,185.86
December	577,321.25	397,176.07
1928—		
January	561,759.57	424,147.92
February	573,619.78	460,217.81
March	725,250.82	520,598.49
April	526,013.13	448,282.44
May	632,968.64	522,980.51
June	608,552.49	625,087.33
July	612,286.49	565,678.37
August	639,074.85	671,864.03
September	570,307.91	737,293.50

Tidewater Pipe Co., Ltd., also delivered in September, 261,905.21 bbls. Oklahoma oil.

AVERAGE DAILY RECEIPTS OF CALIFORNIA OIL AT ATLANTIC AND GULF COAST PORTS

Average bbls. per day—	ATLANTIC PORTS Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
April	9,033	9,167	24,133	18,167	7,867	66,367	.....	.....	.....	.....	.....	66,367
May	19,355	5,387	19,581	16,419	4,774	65,516	.....	.....	.....	.....	.....	65,516
June	11,800	.....	23,367	19,700	9,000	63,867	.....	.....	.....	.....	.....	63,867
July	19,807	2,903	8,774	20,419	2,453	54,355	.....	.....	.....	.....	.....	54,355
August	18,161	3,613	27,774	17,677	2,419	69,645	.....	.....	.....	.....	806	70,451
September	11,100	.....	18,967	38,200	6,700	74,967	.....	.....	.....	.....	.....	74,967

AVERAGE DAILY IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS

Average bbls. per day—	ATLANTIC PORTS Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
April	18,267	5,800	124,133	33,200	36,067	217,467	9,333	23,467	2,167	133	35,100	252,567
May	28,000	7,033	107,484	32,129	21,936	196,581	3,871	24,032	.....	1,904	29,807	226,388
June	24,900	12,233	119,867	41,667	19,300	217,967	1,833	15,567	2,167	.....	19,567	237,534
July	23,484	14,548	111,903	37,678	21,452	209,065	9,355	25,000	.....	774	35,129	244,194
August	25,290	16,323	123,226	21,613	7,194	193,645	.....	38,677	.....	613	39,290	232,935
September	22,933	19,100	110,467	30,700	14,333	197,533	6,367	41,300	6,333	1,667	55,667	253,200

GROSS PRODUCTION IN UNITED STATES FOR 12 MONTHS

(In barrels of 42 gallons)

		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mountains	Eastern Fields	Total
October:	Month	19,448,893	24,247,053	19,200,098	3,509,169	3,117,298	2,058,889	3,258,885	3,400,000	77,240,285
	Daily average	627,384	782,163	619,358	113,199	100,555	66,416	72,867	109,677	2,491,622
November:	Month	18,516,467	23,083,380	18,628,290	3,313,650	2,906,760	1,956,960	3,234,730	3,302,500	73,942,737
	Daily average	617,216	769,446	620,943	110,455	98,892	65,232	74,491	110,083	2,464,758
December:	Month	18,938,823	23,208,417	19,840,009	3,427,174	2,962,750	1,927,148	3,400,578	3,219,900	74,924,799
	Daily average	610,930	716,400	640,000	110,554	95,576	62,166	77,438	103,868	2,416,974
January:	Month	19,028,228	20,978,320	20,024,981	3,319,325	2,791,922	1,805,015	3,429,375	3,133,000	73,510,166
	Daily average	613,814	676,720	645,967	107,075	90,061	58,226	78,367	101,064	2,371,296
February:	Month	18,038,459	19,294,326	19,645,488	3,079,887	2,571,575	1,759,606	3,230,887	3,166,000	69,786,228
	Daily average	622,016	665,324	677,431	106,203	88,675	60,676	76,927	109,173	2,406,456
March:	Month	19,118,320	20,162,524	21,466,632	3,379,031	2,687,948	1,871,158	3,401,632	3,522,000	74,609,634
	Daily average	616,720	650,404	692,472	109,001	86,708	60,360	77,481	113,613	2,406,759
April:	Month	18,280,729	19,096,920	21,845,428	3,412,260	2,472,600	1,915,020	3,370,810	3,231,000	72,624,767
	Daily average	609,357	636,564	728,180	113,742	82,420	63,835	79,027	107,700	2,420,558
May:	Month	19,331,866	19,443,355	21,191,561	3,367,809	2,843,847	1,926,036	3,525,043	3,619,000	74,248,517
	Daily average	623,609	627,205	683,599	108,639	91,727	62,130	81,454	116,742	2,395,113
June:	Month	19,164,244	18,482,981	19,802,520	3,202,050	3,075,911	2,112,149	3,426,470	3,394,000	71,659,325
	Daily average	638,808	616,099	660,084	106,735	102,530	70,405	80,849	113,133	2,388,644
July:	Month	19,754,458	18,809,498	22,155,335	3,171,548	2,792,139	2,237,738	2,492,586	3,472,000	74,885,302
	Daily average	637,241	606,758	714,688	102,308	90,069	72,185	80,406	112,000	2,415,655
August:	Month	19,444,849	20,840,494	23,201,257	3,147,058	2,711,787	1,221,677	2,661,840	3,571,200	76,700,213
	Daily average	627,255	672,274	716,170	101,518	87,477	71,667	82,640	115,200	2,474,200
September:	Month	18,908,169	22,456,860	21,564,260	3,047,250	2,540,070	1,829,625	2,482,430	3,420,000	76,188,664
	Daily average	630,272	748,562	718,475	101,575	84,669	60,987	81,081	114,000	2,539,622
	Total 12 months	227,973,555	249,104,228	247,555,859	39,376,211	33,474,607	23,621,023	28,764,545	40,450,600	890,320,628
	Daily average	622,878	680,613	676,382	107,586	91,461	64,538	78,592	110,521	2,432,570

The ADVERTISERS' INDEX

A

Acme Fishing Tool Co.
Aetna Ball Bearing Mfg. Co.
Ajax Iron Works
Ajax Rope Co. 181
Alco Oil Tool Co. 82-83
Allegheny Steel Co.
Allis-Chalmers Mfg. Co. 50
Alloys Company, The
Aluminum Co. of America
American Cable Co., Inc.
American Car & Foundry Co.
American Hammered Piston Ring Co. 18
American Iron & Machine Works, Inc. 13
American-La France & Foamite Corp.
American Radiator Co.
American Roller Bearing Co.
American Rolling Mill Co.
American Schaffer & Budenberg Division, Consolidated Ashcroft Co., Inc.
American Sheet & Tin Plate Co.
American Steam Pump Co. 180
American Telephone & Telegraph Co.
American Well Works 182
Andrews Steel Co. 180
Arco Company, The
Armstrong Bros. Tool Co. 182
Ash Grove Lime & Portland Cement Co.
Athey Truss Wheel Co.
Atmore, Robert N., Co.
Austin Co.
Axelson Machine Co. 53

B

Babcock & Wilcox Tube Co., The
Badger, E. B., & Sons Co.
Baker Casing Shoe Co. 94
Baldwin Chain & Mfg. Co.
Banner Rock Products Co.
Barber Asphalt Co., The
Barber-Greene Co.
Barco Manufacturing Co.
Barnickel, Wm. S., & Co. 15
Barnsdall Refineries, Inc.
Bartlesville Supply Co.
Bartlett, Hayward Co., The
Beaumont Iron Works Co.
Belmont Packing & Rubber Co.
Bessemer Engine Co. 56
Bethlehem Steel Co.
Bignall & Keeler Machine Works 67
Blackor Co. 108
Borden Co. The
Bovaird Supply Co., The
Braden Steel Corp.
Braun, C. F., & Co. 80
Brewster Co., Inc., The
Bridgeport Machine Co.
Bristol Co.
Broderick & Bascom Rope Co. 171
Brown, Arthur C. 182
Brown Instrument Co.
Brownell Co. 174
Buckeye Traction Ditcher Co.
Buda Co.
Buffalo Gasolene Motor Co. 136
Burt Mfg. Co.
Butler Mfg. Co.
Byers, A. M., Co.
Byron Jackson Pump Mfg. Co. 3

C

Campbell J. A. 124
Carbondale Machine Co.
Carey, The Phillip Co.
Caterpillar Tractor Co. 126
Celite Products Co.
Central Alloy Steel Corp.
Central Tube Co.
Chain Belt Co.
Champion Machine & Forging Co.
Chaplin-Fulton Mfg. Co., The 180
Chapman Valve Mfg. Co.
Chestnut & Smith Corp. 17
Chicago Bridge & Iron Works
Chicago Pneumatic Tool Co.
Chisholm-Moore Hoist Corp.
Clark Bros. Co. 68
Classified Wants 144-145
Climax Engineering Co.
Colona Mfg. Co.
Columbian Rope Co. 172
Connor, The W. B., Co., Inc.
Consolidated Ashcroft Hancock Co., Inc.
Continental Supply Co., The 20-132
Cooke Seal Ring
Cooper, C. & G., Co. 72-73
Coronado Hotel, The
Crane Co.
Crane Packing Co.
Crescent Belt Fastener Co.
Crucible Steel Co. of America
Curtis & Curtis Co., The

D

D. & B. Pump & Supply Co.
Darling Valve & Mfg. Co.
Dart, E. M., Mfg. Co.
Davis, G. M., Regulator Co. 170

D

Dearborn Chemical Co.
Delta Electric Co.
Detex Watchclock Corp.
Dixon, Joseph, Crucible Co.
Donovan Boiler Works, Inc.
Drane Humphreys Co., Inc.
Dresser, S. R., Mfg. Co. 33
Dunn Mfg. Co.

E

Eagle-Picher Lead Co.
Economy Pump & Oil Tool Co., The
Edward Valve & Mfg. Co., The
Elliott Core Drilling Co. 100
Empire Oil & Refining Co.
Emsco Derrick & Equipment Co. 97-118
Engineering, Research & Equipment Co. 102
Ethyl Gasoline Corp.

F

Fairbanks-Morse & Co.
Fenwick-Reddaway Mfg. Co.
Fisher Governor Co.
Fisk Tire Co., Inc., The
Fiske, Leland E.
Flexible Steel Lacing Co.
Ford Chain Block Co. 122
Foster Wheeler Corp.
Foxboro Co., Inc., The 71
Franklin Valveless Engine Co.
Frick-Reid Supply Corp. 48
Fulton Iron Works Co.

G

Gardner-Denver Co. 44
Garlock Packing Co.
Gaso Pump & Burner Mfg. Co. Inside Back Cover
General Electric Co.
Gilbert & Barker Mfg. Co.
Goble, B. G.
Goodrich, B. F., Rubber Co. Inside Front Cover
Goodyear Tire & Rubber Co.
Gott, H. P., Mfg. Co. 174
Goulds Pumps, Inc.
Graver Corp. 139
Gray Processes Corp.
Greenspon's, Joseph, Sons, Iron & Steel Co. 177
Griscom-Russell Co. 123
Guiberson Corp. 43
Gulf-Caribbean Steamship Line., Inc.
Gulf Refining Co. 10

H

Halliburton, Erle P., Co. 41
Halliburton Oil Well Cementing Co.
Harbison-Walker Refractories Co.
Harrell, F. O. 182
Harrisburg Pipe & Pipe Bending Co.
Haynes Stellite Co.
Hazard Wire Rope Co.
Heat Transfer Products, Inc. 179
Heppenstall Forge & Knife Co.
Hercules Motors Corp.
Hercules Supply Co.
Heydrick Mapping Co. 182
Hill, Hubbell & Co.
Hills-McCanna Co.
Hinderliter Tool Co. 63
Hope Engineering Co. 46
Hough, Charles N., Mfg. Co.
Hughes Tool Co. Back Cover
Humble Oil & Refining Co.
Hunt, Robert W., Co.
Hussman Hotel
Hyatt Roller Bearing Co.

I

Imperial Belting Co.
Imperial Royalties Co.
Ingersoll-Rand Co.
International Cement Corp.
International Compositions Co. 178
International Creosoting & Construction Co.
International Derrick & Equip Co. 89
International Harvester Co. of America
International Nickel Co., Inc., The 131
International Supply Co. 117

J

Jarecki Mfg. Co.
Jefferson Union Co.
Jenkins Bros.
Jensen Brothers Mfg. Co.
Johns-Manville Corp. 55
Jones & Laughlin Steel Corp. 165
Jones, The S. M., Co. 178

K

Kansas City Testing Laboratory
Kaw Steel Construction Co.
Kellogg, M. W., Co. 176
Kelly Company 19
Kelly, John Eoghan
Kennedye-Plumb Corp. 181
Kennedy Valve Mfg. Co., The 128

K

Kerotest Mfg. Co.
Kohler Co. 173
K-W Ignition Corp., The 143

L

Landis Machine Co.
Larkin & Co.
Layne & Bowler Co. 12
Leader Iron Works
Lehmann Machine Co.
Leschen, A., & Sons, Rope Co.
Lientz, B. P., & Co.
Lincoln Electric Co.
Linde Air Products Co.
Link-Belt Co.
Long-Bell Lumber Co., The
Longyear, E. J., Co. 173
Lorraine Corp., The
Lucey Products Corp.
Ludlow Valve Mfg. Co. 59
Lufkin Fdy. & Mch. Co., The
Lufkin Rule Co. 182
Lummus, The Walter E., Co.
Lunkenheimer Co. 180

Mc

McCord Radiator & Mfg. Co. 120
McEverlast, Inc. 90
McEvoy, J. H., & Co.
McGregor Working Barrel Co. 176
McIntosh & Seymour Corp.
McKee, Arthur G., & Co.

M

M. & V. Tank Co. 182
MacGregor Valve Co.
Mack International Motor Truck Corp.
Macwhyte Co. 178
Madison-Kipp Corp.
Magnolia Petroleum Co. 14
Maloney Tank Mfg. Co. 137
Manzel Bros. Co.
Marion Machine Fdy. & Supply Co.
Marsh Gauge Pole Co. 178
Martin-Loomis Corp. 78
Mason Regulator Co. 127
Mathieson Alkali Works, Inc.
Merco Nordstrom Valve Co.
Merrick & Longbottom, Inc. 179
Merrill Company, The
Metric Metal Works 7
Mettler, Lee B., Co. 111
Midwest Piping & Supply Co.
Miller, Max B., & Co., Inc.
Milton, S. G., & Son
Moon Mfg. Co. 174
Moore, Lee C., & Co., Inc. 9
Myers, F. E., & Bro., Co. 181

N

National Petroleum Engineering Co. 182
National Supply Co. 85
National Transit Pump & Machine Co. 39
National Tube Co.
Naturaline Company of America
Neilan, Schumacher & Co. 175
Newton Process Mfg. Co.
Norris Brothers, Inc. 175
North American Car Corp.
Northern Pump Co.
Nugent & Co., Wm. W. 182
Nuttall, R. D., Co. 112
Nye Tool & Machine Works

O

Oakite Products, Inc.
O'Brien Steel Construction Co. 179
Ohio Injector Co., The
Oil Conservation Engineering Co., The
Oil Country Specialties Mfg. Co.
Oil Insurance Association
Oil Well Improvements Co., The
Oil Well Supply Co. 64-65
Oklahoma Contracting Co.
Oklahoma Gas & Electric Co. 6
Oxweld Acetylene Co. 11

P

Page Steel & Wire Co.
Parkersburg Machine Co.
Parkersburg Rig & Reel Co. 121
Parsons Co., The 130
Patrick, R. S. 179
Patterson-Ballagh Corp. 92-93
Pattin Brothers Co.
Penberthy Injector Co. 125
Petroleum Iron Works Co.
Pforzheimer, Carl H., & Co. 177
Phillips Petroleum Co. 8
Pittsburgh-Des Moines Steel Co.
Pittsburgh Equitable Meter Co. 181
Pittsburgh Steel Products Co.
P. L. & M. Co. 108
Pomona Pump Co.
Powell, William, Co.
Power Piping Co. 177
Prescott Co., The
Prest-O-Lite Co., Inc., The

P

Pure Oil Co. 4
Pyle National Co.
Pyrene Manufacturing Co.

Q

Quaker City Rubber Co. 176

R

Reading Iron Co.
Reading Steel Casting Co., Inc.
Regan Forge & Engineering Co. 167
Reid, Joseph, Gas Engine Co.
Republic Iron & Steel Co. 135
Republic Supply Co.
Republic Supply Co. of Calif. 79
Rhode Island Fittings Co.
Riter-Conley Co. 182
Robinson Orifice Fittings Co. 105
Ross-Meehan Foundries
Russell Mfg. Co., The
Ryerson, Joseph T., & Sons, Inc. 178

S

Safety Gas Main Stopper Co. 182
Shaffer, J. E., Co.
Shaffer Tool Works 107
Shaw, S. F.
Sinclair Refining Co. 155
Sivyer Steel Casting Co.
Skelly Oil Co.
Skinner, M. B., Co.
Smith, A. O., Corp. 5
Smith Separator Co. 76
Smooth-On Mfg. Co. 171
Sootless Spark Plug Co.
South Chester Tube Co.
Southern Cornice Works
Southwestern Engineering Corp. 31
Spang & Co.
Spang, Chalfant & Co., Inc. 16
Spartan Aircraft Co. 115
Standard Steel Works 130
Star Drilling Machine Co.
Staynew Filter Corp.
Steiner, George 182
Stockham Pipe & Fittings Co.
Stoody Co.
Stork Engineering Co.
Strom Steel Ball Co.
Sullivan Machinery Co.
Sun Shipbuilding & Dry Dock Co.
Sure Shot Torpedo Co.
Swartwout Co., The 164
Sweet, Wm. J., Foundry Co.

T

Taubman Supply Corp.
Templeton, Kenly & Co., Ltd. 181
Texas Gulf Power Co.
Texas Pacific Coal & Oil Co.
Thermoid Rubber Co.
Timken Roller Bearing Co. 140
Titusville Iron Works Co., The
Toledo Pipe Threading Machine Co. 119
Traction Machine Co., The
Trimont Mfg. Co.
Trumble Gas Trap Co.
Tulsa Boiler & Machinery Co.
Tulsa Sheet Metal Co.
Twin Disc Clutch Co.

U

Union Wire Rope Corp. 129
United Air Cleaner Co.
Universal Oil Products Co. 37

V

Vez Company 61
Victaulic Co. of America
Victor Balata & Textile Belting Co. 177
Victor Oxy-Acetylene Equip. Co. 105
Vogt, Henry, Machine Co. 169

W

Wagner Electric Corp. 2
Wailes Dove-Hermiston Corp.
Walworth Co. 1
Washburne, Chester W. 182
Waukesha Motor Co. 75
Welding Engineering Co.
Westcott & Greis
Westinghouse Electric & Mfg. Co.
West Texas Utilities Co.
Wico Electric Co.
Wieman-Kammerer-Wright, Inc.
Williams, J. H., & Co.
Williamsport Wire Rope Co.
Williams Tool Corp.
Wilson Oil Tools Corp. Front Cover
Wilson-Snyder Mfg. Co.
Wilson Welder & Metal Co., Inc.
W-K-M Company, Inc.
Worthington Pump & Machinery Corp.
Wright Mfg. Co.

Y

Yale & Towne Mfg. Co.
Young Engine Corp.

Z

Zwetsch Heinzelmann & Co.